NavMed 369

UNITED STATES NAVY

MEDICAL NEWS LETTER

Editor - Captain F. W. Farrar, MC, USN

Vol. 11 Friday, 16 January 1948 No. 2

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Myocarditis: The autopsy material submitted to the Army Institute of Pathology during the recent war contained an unusually large number of cases of myocarditis. In view of current interest in this subject aroused by the reports of transitory electrocardiographic alterations in a number of different diseases, a review of this wealth of material was considered important in determining an anatomic background for such changes. A total of 1,402 cases of myocarditis verified by pathologic examination was available for review.

In recent years considerable interest has been aroused by the publication of a number of case reports of Fiedler's (idiopathic, or isolated) myocarditis. The clinical records not infrequently refer to an acute febrile illness shortly before, or coincident with, the onset of the cardiac disorder. To assay the significance of such acute illnesses in relation to cardiac symptoms, it was necessary to review not only a large number of cases of myocarditis, but also to ascertain the incidence of carditis in various acute diseases. Saphir made such a review in 1941, reporting a series of 240 cases of myocarditis encountered in 5,626 consecutive autopsies. One hundred eighty-six of the reported cases were nonrheumatic, and in a distressing proportion the myocarditis had gone unrecognized by the clinicians who had studied the cases in life. Similar observations can be made on the 1,402 cases accumulated at the Army Institute of Pathology. There were only 130 cases of rheumatic carditis, so that the heart condition in more than 90 per cent of the series was nonrheumatic. Clinically, myocardial involvement had not been suspected in the majority of these. The proportion of missed diagnoses becomes still more impressive if the diphtheria cases, constituting approximately 10 per cent of the total, are excluded; but for that matter, the cardiac complication was recognized in only one third of them.

The diagnostic failure cannot be attributed to an absence of signs or symptoms. The clinical records frequently mention cyanosis, dyspnea, and orthopnea. A significant degree of hypotension was often observed, and with it a weak, feeble, or thready pulse. Often the recorded pulse rate and temperature showed a loss of the normal ratio. Sometimes chest pain, characterized by substernal oppression or discomfort, was observed. Electrocardiograms, in the majority of instances in which they were taken, disclosed evidence of myocardial damage. Manifestations of congestive heart failure, which occurred in an appreciable number of cases, included distended neck veins, serous effusions, swollen tender liver, and dependent edema. Unexpected deaths were numerous, and in the small group of patients who survived for periods ranging from one to six months, embolic phenomena were observed.

The table on the opposite page shows the wide variety of diseases and conditions found associated with the myocarditides encountered in this series. The known etiological agents include: toxic substances (diphtheria); physical or chemical agents (heat stroke and carbon monoxide poisoning); various specific virus, rickettsial, spirochetal, and fungous diseases; less specific infectious processes; and various metabolic states such as inanition and hypersensitivity.

Diseases Associated With Myocarditis*.

	Column 1	Column 2
Rickettsial diseases		
Scrub typhus	227	227
Epidemic typhus	23	48
Rocky Mountain spotted fever	9	19
Diphtheria	144	221
Subacute bacterial endocarditis	208	208
Rheumatic heart disease	130	130
Meningococcemia	111	256
Scarlet fever	24	44
Weil's disease	7	8
Relapsing fever	6	11
Syphilis (gummatous)	2	66
Chagas' disease	1	1
Schistosomiasis	5	41
Malaria	5	135
Trichinosis	2	2
Acute encephalitis	13	144
Poliomyelitis	13	94
Infectious mononucleosis	6	9
Measles		
Guillain-Barré syndrome	3	30
Mumps	1	8
Epidemic hepatitis	1	400
Smallpox	1	9
Virus pneumonia	32	222
Tuberculosis	9	581
Boeck's sarcoid	3	12
Coccidioidomycosis	11	48
Blastomycosis	2	5
Actinomycosis	1	9
Torulosis	1	6
Septicemia		
Streptococcus	11	23
Staphylococcus	34	107
Pneumococcus	9	18
Other acute bacteremias	15	Unknown
Acute glomerulonephritis	14	160
Acute tonsillitis	12	Unknown
Acute nasopharyngitis	41	Unknown
Cellulitis, lymphangitis, and wound infections	13	Unknown
Tularemia	1	16
Brucellosis	2	4
Miscellaneous (postinfectious)	13	Unknown
Exfoliative dermatitis	7	44
Arsenical reaction	1	18
Sulfonamide hypersensitivity	105	Unknown
Disease unknown (so-called "idiopathic")	43	
Starvation	33	50
Heat stroke		
Surviving less than 24 hours	16	45
Surviving more than 24 hours	13	26
Carbon monoxide poisoning (limited to patients who survived for an appreciable interval after the lethal exposure)	1	30
Emetine	1	70
Burns	11	45
Total	1,402	

*The figures in the first column represent the number of times myocarditis was encountered. Wherever possible the number of cases of each disease, screened to ascertain the first figure, is given in column two. The ratio of the two thus provides a crude index of the frequency of myocarditis in each disease.

It would be a mistake to conclude that such a grouping is sharp and distinctive. For example, it is impossible to evaluate properly the effects of absorbed toxins, bacterial infections, and treatment in the myocarditis associated with burns, or of secondary bacterial infections so frequently complicating primary virus diseases. Nor are these the only conditions in which other infectious processes interfere with analysis of the cardiopathic effect; only six of the 33 cases of starvation associated with myocardial inflammation could not be related to a coexistent infectious process. In other diseases, such as infectious mononucleosis, acute infectious polyneuritis (Guillain-Barre syndrome), and Boeck's sarcoid, the current limitations of medical knowledge prevent proper cataloguing.

Although some of these myocarditides may be considered of academic rather than clinical interest, it is axiomatic that sound therapy can be based only on an accurate appraisal of the pathologic alterations. (Am. Heart J., Dec. '47 - I. Gore and O. Saphir)

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Myocarditis Associated with Acute Nasopharyngitis and Acute Tonsillitis: Nonrheumatic myocarditis occurring in the course of, or following acute infections of, the upper respiratory tract is a relatively unexplored subject. Rantz, Boisvert, and Spink, who were associated with the Commission on Hemolytic Streptococcal Infections during World War II, set the incidence of this complication at 10.8 per cent. Their convincing epidemiologic and clinical studies did not include anatomic data. The series of 11 nonfatal cases of myocarditis following various infectious diseases reported by Candel and Wheelock included one in which peritonsillar abscess was present. They also described one fatal case in which myocarditis was observed at postmortem examination after acute tonsillitis. Scherf reported 5 nonfatal cases in which myocarditis followed acute tonsillitis, and stated that in his experience this complication occurred in from 10 to 15 per cent of such cases. Substantial pathologic verification would be needed, however, before such a high incidence could receive more than probational acceptance.

In a study of the pertinent material available at the Army Institute of Pathology, 35 instances of nonrheumatic myocarditis in association with upper respiratory infections were encountered (acute tonsillitis in 12 and acute nasopharyngitis in 23). In all cases the diagnosis of pharyngeal or tonsillar infection had been made clinically. Streptococci were cultured from the throat in 12 and from the heart's blood, post mortem, in three; grouping and subtyping had not been done. Septicemia was not considered of etiological moment since significant visceral alterations were absent in all 35, and negative blood cultures were obtained in 13. Corynebacterium diphtheriae was absent from the culture material and diphtheria had been excluded clinically in each instance. The patients, with one exception, were men; most of them were between 20 and 30 years of age, the youngest being 18 and the oldest 43.

Clinical Observations. The temperatures noted in 33 patients ranged between 99° and 104.4° F., averaging about 102° F. The pulse rate varied from 60 to 168 per minute. In 14 the pulse rates and temperatures did not show proportionate variations; the pulse rate was disproportionately fast in six and disproportionately slow in eight. Cyanosis was noted in 12 patients, frequently in association with dyspnea which was observed in 16. Cheyne-Stokes respiration was present in two patients. Oppressive substernal pain was encountered in six, in every instance associated with dyspnea.

Electrocardiographic studies in five cases showed evidence of "myocardial damage" in three and disturbances in rhythm in two.

Low arterial tension occurred as a prominent clinical feature in five of 12 patients with nasopharyngitis in whom arterial blood pressures were recorded and was present in four of the seven patients with tonsillitis whose blood pressure readings were available. There were five patients with systolic pressures of from 90 to 100 and four with pressures of from 80 to 90. A weak thready pulse, presumptive evidence of low blood tension, was observed in seven patients.

Twenty-six patients received sulfonamides; many were also given penicillin. Intravenous fluids were frequently administered, especially in the terminal phase of the illness. Azotemia as a result of urinary suppression developed in two of the patients who had received sulfonamides; their blood nonprotein nitrogen estimations were 85 and 210 mg. per cent, respectively.

The duration of hospitalization among the patients with nasopharyngitis averaged seven days, although five died within 24 hours (after illnesses which had begun from three to 8 days before) and two survived for 24 days. Length of hospitalization among the patients with tonsillitis averaged 8 and 1/2 days.

Postmortem Observations. The cause of death was determined as cardiac failure in all cases. There were 15 unexpected deaths, and in the remaining cases the pathologic findings included passive hyperemia of the viscera in all, pulmonary edema in most, and serous effusions in 17 (10 of these were either extrathoracic or were unassociated with a pneumonic process). In addition to cardiac changes, certain other abnormalities were noted at autopsy. Among the 23 patients with nasopharyngitis, 10 had bronchopneumonia and three had interstitial pneumonia. Streptococci were cultured from the lungs of 5 and two of these, respectively. Thrombi were found in the left ventricle in one case in which there were also visceral infarcts and gangrene of the right leg. Pulmonary infarcts of unspecified origin were observed in another.

Among the 12 cases of tonsillitis, bronchopneumonia and pericarditis occurred in one, bronchopneumonia with abscess formation in another, and peritonsillar abscess in a third. The parenchymatous organs in all 35 cases were the seat of varying degrees of cloudy swelling. There was moderate renal tubular damage and interstitial cellular infiltration in the two cases in which azotemia developed; sulfa crystals were identified in one of these.

Cardiac Findings. At autopsy all but 6 of the hearts were found to be dilated; frequently they were increased in weight. Histologically, the changes in the myocardium were striking. The lesions varied from circumscribed focal areas of inflammation, principally involving the interstitial tissues to areas of diffuse inflammatory infiltration associated with necrosis of muscle fibers. Gradations from obviously very recent inflammation to definitely healing and organizing lesions were observed. The inflammatory process was patchy in distribution and there appeared to be no special region of the myocardium for which it had a predilection. When the heart was severely involved the intensity of the process frequently varied from one section to another. In instances of less intense involvement, it was not uncommon to find areas of the heart muscle in which inflammatory changes were minimal or even absent. The inflammatory cellular response was predominately and characteristically mononuclear. The proportion of each cell type encountered was not uniform and varied from one area to another. In the most cellular zones lymphocytes outnumbered the other elements, which included endothelial leucocytes and Aschoff cells, mononuclear cells larger than lymphocytes with densely stained nuclei, and polymorphonuclear leucocytes. Occasionally, the last cell named made up as much as one third of those present, but abscesses were not encountered. Polymorphonuclear leucocytes were less numerous in areas of less intense inflammation, and endothelial cells and Aschoff cells predominated in the areas where inflammation was least. These endothelial and Aschoff cells frequently formed small accumulations about a few intensely acidophilic, homogeneous muscle fibers, or somewhat more diffusely infiltrated the interstitial tissues, especially subendocardially about the orifices of the thebesian vessels. The focal cellular accumulations around a few necrotic muscle fibers appeared to represent a very early and rapid morphologic change which the authors have designated as an "explosive lesion." Plasma cells and eosinophils were found in varying numbers. In older lesions fibroblasts were observed. Mast cells were present, as they are normally, but did not appear to participate to any extent in the inflammatory reaction. Bacteria were absent from all sections examined. Accompanying the inflammatory cells there was exudation of variable quantities of protein-rich fluid into the interstitial tissues.

The lesion involved both the scanty stroma within the muscle fasciculi and the more abundant stroma accompanying the blood vessels in the interfasicular septa. On this basis three histologic types of myocarditis could be distinguished. The first, which the authors have designated the diffuse variety, affected both the muscle and the stroma of the intrafascicular tissue and spilled over, to a variable extent, into the neighboring septa. It invariably was associated with necrosis of the cardiac musculature, which was of moderate degree or more in all except three of the 19 cases of the diffuse type. The second variety, the interstitial type, of which there were 13 examples, was characterized by involvement of the interfascicular septal stroma in particular. Muscle necrosis, which occurred in only three of this group was in each instance of mild degree and "explosive" type. The last variant, which included three cases, was called the mixed type since it exhibited features of both of the others. In general, the estimated severity of the myocardial involvement was greatest in the diffuse histologic variety. Both tonsillar and pharyngeal infections were represented

in each type; however, the diffuse group included 9, the interstitial group two, and the mixed group one of the fatalities due to acute tonsillitis. It was evident from inspection of these data that there is no correlation between the duration of the illness and the type or severity of the myocarditis. Fatalities occurred between 4 and 37 days, 7 and 24 days, and 3 and 23 days in each of the groups, respectively.

In the diffuse group in which parenchymatous lesions were the rule, the state of disintegration, phagocytosis, and lysis of the necrotic muscle fibers served as a crude index of the duration of the disease. Fibrosis, observed in 8 cases and representing early healing, did not occur earlier than the thirteenth day. Considerable variation was observed, not only in the presence or absence of myocarditis in different areas of the myocardium but also in its severity and in its estimated duration. Hyalinized or granular necrotic muscle fibers with varying degrees of surrounding inflammation, occurring next to areas of almost complete myolysis, were suggestive of continued activity of the damaging agent.

A similar patchy distribution of the cardiac lesion was observed in the interstitial variety of myocarditis. In that form there were no evident histologic criteria to indicate the duration of the process. Foci of collagenous necrosis were found in 4 instances of interstitial involvement and in one of the mixed group. In the most striking of these was a prominent "palisade" reaction of large mononuclear (Aschoff) cells; however, the lesions did not have the perivascular position characteristic of the rheumatic nodule.

Increased weight of the heart in each of the three histologic variants appeared to be related to the intensity of the myocarditis. Expressed as the ratio of enlarged hearts to total number of hearts weighed, the incidence of increased heart weight in the severe, moderate, and mild groups was 7:11, 5:15, and 2.5 respectively. In the group of "diffuse" parenchymatous lesions, naturally, the number of enlarged hearts was greatest, since a preponderance of the severe cases was in this group. (Am. Heart J., Dec. '47 - I. Gore and O. Saphir)

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Propylthiouracil in the Treatment of Hyperthyroidism: The use of propylthiouracil over a 14-month period has convinced the authors that it is decidedly superior to thiouracil in the treatment of hyperthyroidism. In their opinion propylthiouracil in about half the dose appears to be as effective as thiouracil and is much less toxic in its side effects.

Among the 218 patients in this series treated with propylthiouracil, manifestations which were attributed to toxicity or sensitivity were seen in 7 patients. Three had mild reactions (nausea, arthralgia, and numbness). The drug was continued in all 3 of these patients. The first patient was nauseated while taking 300 mg. a day, but could take 200 mg. without discomfort. In the patients who complained of arthralgia or numbness of the forearms and hands, the symptoms

disappeared while the drug was continued. No hypothyroidism or any evidence of organic nervous disease could be demonstrated in them. Propylthiouracil was discontinued in 4 patients. One patient, after 34 weeks of treatment, while taking from 50 to 150 mg. a day developed a severe dermatitis, simulating the exfoliative type. The second patient complained of numbness of the extremities. This probably was a toxic effect, since no other cause was found to explain it. Because one showed a fall in the granulocyte count to as low as 25 per cent on repeated trials of from 75 to 150 mg. per day, the drug was finally discontinued after 22 weeks of treatment. In one patient, because of urticaria, the drug was discontinued and thyroidectomy was performed. One patient died at his home while taking the drug. He was 65 years old, had a nodular goiter and a poor cardiovascular status. One day, without having complained more than usual, he vomited, became extremely weak, and died within 24 hours. He had no fever. Unfortunately, no further information could be obtained.

The final appraisal of the side effects of propylthiouracil, based on 218 separate clinical trials covering an average of 8 months per patient and using doses of from 50 to 500 mg. a day, confirms the fact that the drug is relatively nontoxic. To date the maximum doses used have caused no more toxic effects than have the small doses. The authors have discontinued the routine practice of taking weekly white blood counts. In prescribing the drug the possibility of a toxic effect is explained to the patient, and it is suggested that a white blood count be made if a sore throat or unexplained fever occurs.

The continuance of hyperthyroidism in a patient with complicating heart disease, diabetes, or tuberculosis may lead to an irreversible downhill course. Even without concurrent disease it is highly desirable to lower the basal metabolic rate as quickly as possible. At best the treatment covers several months, and the patient may be discouraged and lose contact with his physician if the results are too gradual. For this reason, the smaller initial doses of 150 mg. per day as recommended in earlier publications have been replaced by doses of 300 mg. or more per day in moderately severe and in severe hyperthyroidism. Somewhat smaller doses may be sufficient for maintenance.

All of the patients in this series have remained ambulatory and have been treated as office patients except those who were seriously debilitated by complications such as cardiac decompensation of severe degree. Almost all others continued to work or to carry on their usual activities. The basal metabolic rate was determined at intervals of 4 weeks. For comparative purposes a few patients received iodine in doses of from 10 to 30 mg. per day in addition to propylthiouracil. When the metabolic requirements were high and there was a tendency to weight loss, diets supplying as much as 4000 calories per day were prescribed and vitamin B complex was given to a few. Sedatives, such as phenobarbital, were used in doses of 1/2 gr. 3 times a day in many. Otherwise, no other medication was given except that which was necessary to treat a complicating disease.

Eighty-seven selected patients were used to compare the speed of effect of the drug at different dosage levels. Of the 87 patients, 51 had diffuse goiter, 22 had nodular goiter, and 14 had recurrent or residual hyperthyroidism following previous operation. The original basal metabolic rate ranged from +19 to +79 per cent. Complicating disease included rheumatic and arteriosclerotic heart disease, syphilis, diabetes, and pernicious anemia. The dose of propylthiouracil varied from 50 to 400 mg. a day. These cases have been arbitrarily divided into two groups: (1) those receiving less than 150 mg. per day and (2) those receiving 150 mg. or more per day. In the 48 patients with diffuse goiter receiving 150 mg. or more a day, there was an average fall in basal metabolic rate of 2.91 per cent per week, and in three patients with diffuse goiter receiving less than 150 mg. a day, the fall was 2.64 per cent per week. The most rapid response was seen in a patient having recurrent hyperthyroidism with a basal metabolic rate of +60 per cent which fell to -11 per cent in six weeks, an average of 11.8 per cent per week. The dose was 200 mg. per day. In the 15 patients with nodular goiters receiving more than 150 mg. per day, the fall was 2.49 per cent per week as compared with a fall of 1.74 per cent per week in 7 patients on less than 150 mg. In recurrent or residual hyperthyroidism, the fall with the larger dose was 2.96 per cent per week in 8 instances, but it was only 1.18 per cent per week in 6 patients receiving less than 150 mg. per day.

The data in this study were analyzed with respect to effective dose range in another way. For this purpose an effective dose was defined as one which produced a progressive fall in basal metabolic rate of 2 per cent or more per week to within normal range. An effective dose might take more than 3 months at this rate to produce a fall in the basal metabolic rate to within normal range, depending upon the height of the metabolic rate at the beginning of the test. If 3 months passed, however, and a rate of fall of basal metabolic rate less than 2 per cent per week still persisted, the dose employed was called ineffective. A single patient might fail to respond adequately to 150 mg. or even 200 mg. per day and yet respond well to 300 mg. or more.

The authors have seen little disadvantage in using 300 mg. as the initial dose or in continuing it. The basal metabolic rate in many instances drops rapidly down to +20 or +15 per cent and slowly from that level to zero. Often, a good response will be made on 150 mg. until the basal metabolic rate reaches +15 per cent, and then more than 200 mg. per day is necessary to relieve the remaining signs of hyperthyroidism. In a few patients the dose had to be raised even to 400 mg. or more to obtain a normal metabolic rate. Four hundred milligrams or more per day have been used at some time during the treatment of 25 patients.

Frank myxedema occurred twice, and definite symptoms of hypothyroidism appeared in 5 other patients. In these, desiccated thyroid was given and the propylthiouracil was continued in the hope of increasing the chance of securing a permanent remission. Only 2 patients showed significant enlargement of the thyroid. One of these was a young woman who was pregnant, the other a boy 17 years of age.

The authors consider that 300 mg. per day of propylthiouracil is near the ideal dose to be used in active treatment of hyperthyroidism. Although some patients respond to smaller doses, a dose of 300 mg. or more a day has been necessary in 34 per cent of the total number of patients in order to lower the basal metabolic rate to normal range. If toxic results on doses of 300 mg. or more per day are shown to be more frequent in further studies, the routine use of 200 mg. may be tried and the dose increased if an effective response fails to occur. In this way time would be lost, but the minimum amount of the drug would be used.

With regard to speed of control a few general statements may be made. Hyperthyroidism in association with small diffuse goiters in cases in which no previous iodine has been given reacts the most rapidly to propylthiouracil. For this reason in such cases a permanent medical cure may result. Instances have been seen, however, especially in young people, in which increased dosage of the drug is associated with only partial control, appearing to indicate a natural ingravescence of the disease. In some of these the thyroid continues to enlarge during treatment. These patients appear to be of the same type as those in whom more than one recurrence may occur following operation. Such resistance to treatment certainly does not encourage hope for a permanent medical cure.

Hyperthyroidism of long standing has, in most instances, been more resistant to therapy. The goiter is usually larger under such circumstances, and perhaps the mass of reacting thyroid tissue present is a factor of some importance.

Large adenomatous goiters respond more slowly in some instances. If groups of cases are compared, however, it is interesting to note that there is only a small average difference. The impression that the opposite is the case apparently arises chiefly from the fact that there are some very rapid responses among the patients with diffuse goiter and a few very slow responses among those with nodular goiter.

A woman with acromegaly was the only patient with hypermetabolism, which was judged to be at least partly of thyroid origin, who has not responded at all to propylthiouracil. She has had as much as 600 mg. per day for more than 9 months.

Little of value can be said from the data in this study regarding the probable frequency of permanent cure of hyperthyroidism following withdrawal of propylthiouracil. The drug has been discontinued in only 17 patients. Recurrence has been noted in 6 of these. In 4 of the 6 the basal metabolic rate was never shown to have fallen to zero, and in 1 of these the drug was stopped inadvertently by the patient when the basal metabolic rate was +15 per cent.

In 2 patients, after treatment for 36 and 51 weeks, respectively, there was a recurrence in 12 weeks and in 4 weeks after cessation of medication, the basal metabolic rate at cessation having been -9 and -15 per cent, respectively. In

11 other patients remission continued for periods ranging from 1 to 30 weeks in 10, and up to 14 months in 1.

Exophthalmos appears to act during treatment with propylthiouracil in much the same way as it does after thyroidectomy; namely, in the majority it remains approximately the same or there is a slight increase, and in a few there is an increase which occasionally may be extreme. The rate of increase in exophthalmos and its degree of severity appear to bear little or no relationship to the activity of the thyroid gland.

Early in the period of use of thiouracil, desiccated thyroid was employed in doses as high as 2 grains per day in the 3 patients in whom it was tried but failed to eliminate the thrill and bruit from a vascular goiter over a period of a month. Iodine, however, in doses of 10 mg. per day did so in less than a week. It became a matter of interest to know whether such management hindered or helped the antithyroid effect as a whole or interfered with propylthiouracil later. A group of patients who had diffuse goiters of approximately the same size was chosen. Some of these were given iodine in doses of from 10 to 30 mg. per day concurrently with propylthiouracil. The remainder were given no iodine. There was no significant difference in their rate of antithyroid response. For this reason it has become the authors' practice to give iodine in doses of from 10 to 30 mg. per day in cases of Graves' disease to eliminate the thrill and bruit within the gland. It is possible that larger doses of iodine might be used concurrently with propylthiouracil treatment to produce a more rapid response without interference with the final propylthiouracil effect. In view of experimental work bearing on this phase of the problem it must be approached with caution since it has been shown that the thyroid glands of thiourea-treated rats fail to take up iodine in the normal manner, and also because experience has shown that the thiouracil effect may be slowed by pre-treatment with large doses of iodine.

The proper role of propylthiouracil in the management of hyperthyroidism has not been settled and cannot well be settled until the control of increscence of the disease during therapy and the production of lasting remissions after cessation of therapy have been adequately established.

At present the procedure of the authors is as follows, the patients having been graded into the following 4 classes:

1. In patients with small goiters and relatively mild hyperthyroidism an attempt at a medical cure is made. The aim here is to control the symptoms completely and if possible to hold the basal metabolic rate at or below zero for 8 or more months. Exception to this management may arise for various reasons including: (1) the patient's preference for the relative certainty of a surgical cure, (2) lack of intelligence and cooperation of the patient, (3) interference of toxic effects, (4) existence of a solitary adenoma and indication for surgical removal, and (5) presence of pregnancy with consideration of surgery as the more prudent course until safety of the drug to the infant is fully established.

If, after adequate trial and withdrawal of the drug, recrudescence is evident, a choice between its continued use and surgery must be made.

2. In all young people with hyperthyroidism of mild or moderate degree when there is no apparent risk with surgery and when thyroidectomy is decided upon, iodine preparation without propylthiouracil is usually the preoperative treatment of choice because the response is quicker. Propylthiouracil may be used but is unnecessary.

3. Thyroidectomy following complete control of the disease with propylthiouracil is advised (1) in all patients with severe hyperthyroidism, (2) in all those over 45 years of age with hyperthyroidism, and (3) in those with complicating factors such as a poor heart condition. When the disease is controlled, Lugol's solution is given for from 2 to 3 weeks in doses of 1 c.c., 3 times a day. During the week preceding operation no propylthiouracil is given.

4. In patients whose hyperthyroidism is complicated by extreme old age, by cardiac or other complications which will prevent their ever becoming good surgical risks even after the elimination of hyperthyroidism, propylthiouracil may be continued indefinitely. To this group may also be added those patients with postoperative recurrence of hyperthyroidism, because in them the increased morbidity from nerve or parathyroid gland injuries warrants withholding further operation unless it becomes imperative. (Am. J. M. Sc., Nov. '47 - E. P. McCullagh et al.)

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Comparative Study on the Use of the Purified Digitalis Glucosides, Digoxin, Digitoxin, and Lanatoside C, for the Management of Ambulatory Patients with Congestive Heart Failure: Considerable attention has been focused upon the use of purified digitalis glucosides. There is no question that their use offers certain advantages over the digitalis leaf. Since the glucoside is a chemical entity, the physician is assured of uniform potency regardless of the lot prescribed. In contrast to this, digitalis leaf must be submitted to controlled bioassay, the results of which, although indicative of relative potency, cannot be directly applied to man.

As experience was gained in the use of the purified glucosides, it became evident that their potency, when used clinically, bore no relationship to the cat unit potency. If the latter was the basis of dosage, there was no way of predicting, except by clinical trial, whether a particular glucoside would produce results similar to that of digitalis leaf. Most likely, severe toxicity would occur. It, therefore, became imperative that each glucoside should undergo extensive clinical trial in order to establish its relative potency and to determine satisfactory methods of dosage. In the hands of well-qualified cardiologists the use of purified glucosides offers no particular difficulty. However, unless precise directions are available and their pharmacology firmly established, the use of the purified glucosides by the general practitioner may not be satisfactory.

It is for this reason that an extensive program for the evaluation of purified glucosides has been in progress by the authors and co-workers for the past ten years. This report deals with a comparative study of the use of the three glucosides, digoxin, digitoxin, and lanatoside C, in the treatment of the ambulatory patient with congestive heart failure.

The management of the patient with congestive heart failure may be considered as a twofold problem. The importance of the initial digitalization, regardless of the method used, is self-evident. However, in terms of digitalis potency or comparative potencies of the various glucosides, it is not the major problem. The patient can be readily digitalized, regardless of the potency of the preparation used, as long as repeated doses are administered. Of course, the absorbability and rapidity of dissipation of the digitalis preparation should be taken into consideration. Since, in the authors' opinion, the maintenance of the digitalized state is the most important aspect of the management of the patient with congestive heart failure, this study was instituted to determine the following for each glucoside: (1) the daily undivided dose most likely to result in satisfactory maintenance; (2) the daily undivided dose most likely to result in minimal signs and symptoms of toxicity; (3) the therapeutic ratio; (4) the relative ease of establishment of satisfactory maintenance with control of congestive heart failure and ventricular rate; and (5) the ease of predicting the maintenance dose when initiating this dose in a patient who has been previously rapidly digitalized or who has been receiving another digitalis preparation.

The study was conducted on ambulatory patients. All required the daily administration of a digitalis preparation to be maintained in a state of satisfactory compensation. The cessation of digitalis, therefore, or improper maintenance would immediately result in the development of signs and symptoms of congestive heart failure. None of the patients required supplementary diuretic therapy, and if at any time their use became necessary, the patient was no longer followed for maintenance studies.

With few exceptions, the patients had been previously observed for months or years on a standard digitalis leaf preparation (U. S. P. from X to XII) so that their digitalis requirements were well known. The initial dose level of the glucoside substituted for the digitalis leaf was arbitrarily chosen as any multiple of the smallest tablet furnished by the pharmaceutical concern. Regardless of the dose, the patient was advised to take the entire amount as an undivided dose, preferably at the same time each day. As experience was gained in the use of glucosides, it became evident that this was very important for proper maintenance.

In studies with digoxin, experiences with various dose levels showed that there was considerable individual variation in reaction. A daily undivided dose of 1.0 mg. would have resulted in toxicity in 15 of 31 patients (48.4 per cent), but in 16 of 20 patients in whom this dose was tried, maintenance was satisfactory. The maintenance dose of digoxin was established in 30 patients and ranged between 0.25 and 1.5 mg., the dose roughly parallelling the severity of the

underlying heart disease. Seventy per cent of the patients were maintained with a dose of 0.75 mg. or less. The toxic dose for daily administration ranged between 0.5 and 2.0 mg. and was established in 28 patients. Approximately 60 per cent of the patients had toxicity with an undivided dose of 1.0 mg. or above. The dose of choice when initiating maintenance with digoxin, if no knowledge of previous digitalis leaf dosage is available, is 0.5 milligrams. This dose will be effective in the greatest number of patients with the least possibility of toxicity. A daily undivided dose of 1.0 mg. has an equal chance of either maintaining the patient or producing toxicity. If the patient has been previously receiving digitalis leaf, digoxin could be substituted in doses of 0.5 mg. for each 0.1 Gm. of digitalis leaf (U. S. P. XII). In all cases the minimal maintenance dose was established without difficulty. This was accomplished in spite of the rapid dissipation of digoxin which interfered with proper maintenance only if the daily dose was divided.

Fifty per cent of the patients were maintained with a daily dose of 0.1 mg. or less of digitoxin. The toxic daily dose was noted from 0.1 mg. upward but was usually encountered above 0.2 milligram. Thus, approximately 61 per cent of the patients manifested toxicity with a dose of 0.3 mg. or above. As in the case of the other glucosides, considerable individual variation was noted. The maintenance dose ranged between 0.05 and 0.3 milligram. The dose which appears to be the best for selection when the patient requires maintenance for the first time would be 0.1 milligram. This dose will maintain the majority of the patients, and the likelihood of toxicity is very small. The daily administration of 0.2 mg. resulted in toxicity in 37.5 per cent of the patients. The maintenance and toxic doses were established without any difficulty with the exception of one patient who could not tolerate any dose. The smallest size tablet used was 0.1 milligram. With the administration of 0.1 mg. every other day (0.05 mg. per day), adequate maintenance was obtained in seven patients (24 per cent). It is, therefore, recommended that digitoxin should be made available in 0.05 mg. tablets.

The maintenance dose with lanatoside C ranged between 0.5 and 3.0 milligrams. Approximately 62 per cent of the patients were maintained with a daily undivided dose of 1.0 milligram. Toxic effects were noted with 1.0 mg. or more and were usually encountered with a dose greater than 1.5 mg., toxicity occurring in 28 per cent of the patients with this dose or above. Again, there was considerable overlapping of doses and individual variations. This was particularly so for the 1.5 mg. dose with which there is an equal chance of either producing maintenance or toxicity. The most satisfactory dose for initiating maintenance would be 1.0 mg. daily. It was definitely more difficult to establish a maintenance dose with lanatoside C than with the other glucosides. This was reflected in the relatively higher number of trials, 21 per cent of which resulted in congestive heart failure as compared with 12.6 per cent and 10.7 per cent for digoxin and digitoxin, respectively. In 7 patients establishment of the maintenance dose was particularly difficult since the patients were in congestive heart failure with one dosage level and developed toxicity with the next dosage level. In several instances the patient's condition did not allow further studies with

lanatoside C since it was obvious that the maintenance dose would not be established with any degree of certainty in a suitable period of time to benefit the patient. In such cases it became necessary to change to digitalis leaf or another glucoside.

Complete studies for maintenance and toxicity dose for all three glucosides were made on ten patients. In general, the relative potency for each glucoside was the same for each patient. If the patient could be maintained with a small dose of one glucoside, the patient could be maintained with a small dose of the other two glucosides. The same relative potency held also for the toxic dose. With one exception the therapeutic range of all glucosides was not too dissimilar.

The therapeutic ratios for the three glucosides were almost identical. When the minimal maintenance dose was doubled, toxicity occurred with digoxin in 63.6 per cent of the patients, with digitoxin in 65.4 per cent, and with lanatoside C in 62.9 per cent.

With daily doses that produced toxicity, the signs and symptoms were the same for all three glucosides as far as type and incidence were concerned. They differed from those noted with digitalis leaf in two respects. It was unusual for diarrhea to be noted as a toxic symptom for any of the glucosides. Visual disturbances were just as common but did not include yellow or green vision. Occasional patients noted alteration in color vision with emphasis on objects appearing white. Although the impression was gained that gastro-intestinal irritation was less with the use of the glucosides, it is impossible to state with certainty that this is significant. In the authors' experience the usual small doses of digitalis leaf administered for maintenance rarely result in true gastro-intestinal irritation. If a patient develops nausea and vomiting from digitalis leaf, it is invariably the result of central toxicity and the same symptoms would occur for each glucoside if comparable doses were administered.

The glucosides differed, however, in the duration of toxicity. Whereas it was unusual for the signs and symptoms of toxicity to persist longer than 48 hours for either digoxin or lanatoside C, in many instances the toxicity following digitoxin persisted for from 72 to 96 hours or even a week. Furthermore, in adjusting the dose of the glucoside following the occurrence of toxicity, it was absolutely imperative to stop the administration of digitoxin for several days. In the case of lanatoside C or digoxin, the patient could easily continue on a smaller dose or even the same total dose, but in divided amounts, and yet have all signs and symptoms of toxicity subside very promptly.

With the exception of an occasional patient who cannot tolerate digitalis leaf because of local gastro-intestinal irritation and the psychologic factor of having digitalis prescribed, the use of the purified glucosides does not offer any other advantage over digitalis leaf. Purified glucosides will not result in a more efficient or safer digitalization. The patient will not be maintained any more effectively. If a patient is no longer satisfactorily maintained with digitalis

leaf and toxicity occurs with the next dosage level, the substitution of a purified glucoside will result in the same response if comparable doses are used. In other words, the glucosides may vary in terms of latency of action, speed of dissipation, and degree of gastro-intestinal absorption, but they appear to be identical as far as their action upon improving the efficiency of heart muscle is concerned. Furthermore, the toxic manifestations, although differing in duration, appear to be generally the same for the purified glucosides and digitalis leaf.

In comparing any particular glucoside with any other, the same relative potencies held for both maintenance and toxic doses. The therapeutic range for each preparation appears to be the same. However, in the case of lanatoside C, the therapeutic range in some instances appears to be exceedingly small. This is related to factors other than cardiac action and may be explained either by rapidity of dissipation or destruction of the drug in the gastro-intestinal tract or by a combination of both of these factors. Evidence in favor of destruction is the relative difficulty encountered in determining the maintenance dose of lanatoside C in respect to digoxin; dissipation studies of both of these glucosides in man are similar. Furthermore, knowing the maintenance dose of digitalis leaf, digitoxin, or digoxin, it was comparatively easy to predict the maintenance dose or interchange of any three of these preparations, whereas for lanatoside C it was a question of trial and error in many cases. This definitely impairs the usefulness of lanatoside C for oral use in maintenance. The usefulness of digitoxin, though satisfactory for maintenance, is offset by its slow rate of dissipation and prolonged toxicity. Furthermore, the dosage forms that are supplied at present, 0.1 and 0.2 mg., do not lend themselves to great freedom in establishing satisfactory maintenance levels. An increase of 100 per cent in dosage of digitoxin is relatively more dangerous than the same increase of digoxin or lanatoside C. For these reasons digoxin appears to be the glucoside of choice for the daily management of the patient with congestive heart failure. (Am. Heart J., Nov. '47 - R. C. Batterman and A. C. DeGraff)

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Use of Chemotherapeutic and Antibiotic Agents: The physician, when confronted with an infectious process that may respond to one of several chemotherapeutic or antibiotic agents, should consider the following questions in selecting the agent to be used for treatment:

Which agent will be the most effective?

What is its relative toxicity in the dosage prescribed?

With what ease can it be given?

What will be its cost, or the auxiliary costs of its administration, to the patient?

Also, it must be remembered that all the sulfonamides and antibiotics in common use are capable of producing serious toxic reactions.

Tables 1, 2, and 3 present in general terms the compounds of choice for the treatment of infections of average severity. It is to be noted that sulfanilamide and sulfathiazole are not included. Either of these drugs may be used

TABLE 1. *Present-Day Usage of Sulfonamides and Antibiotics in Beta-Hemolytic Streptococcus Infections.**

INFECTION	AGENT
Tonsillitis	Sulfadiazine and derivatives†; penicillin G.‡
Peritonsillar abscess	Sulfadiazine and derivatives†; penicillin G.‡
Ludwig's angina	Combination of sulfadiazine and derivatives with penicillin G
Acute sinusitis	Sulfadiazine and derivatives†; penicillin G.‡
Otitis media	Sulfadiazine and derivatives†; penicillin G.‡
Mastoiditis	Combination of sulfadiazine and derivatives with penicillin G
Meningitis	Combination of sulfadiazine and derivatives with penicillin G
Erysipelas	Sulfadiazine and derivatives†; penicillin G.‡
Scarlet fever	Sulfadiazine and derivatives†; penicillin G.‡
Adenitis	Sulfadiazine and derivatives†; penicillin G.‡
Cellulitis	Sulfadiazine and derivatives†; penicillin G.‡
Pneumonia	Combination of sulfadiazine and derivatives with penicillin G
Empyema	Combination of sulfadiazine and derivatives with penicillin G
Peritonitis	Combination of sulfadiazine and derivatives with penicillin G
Puerperal sepsis	Combination of sulfadiazine and derivatives with penicillin G
Septicemia	Combination of sulfadiazine and derivatives with penicillin G
Osteomyelitis	Sulfadiazine and derivati ves†; penicillin G.‡
Ulcers	Sulfadiazine and derivatives†; penicillin G.‡
Impetigo	Sulfadiazine and derivatives

*Indications are for oral and parenteral use only. It will be noted that streptomycin and sulfaguanidine and similar sulfonamide derivatives should not be used in the infections listed. Penicillin G is contraindicated in impetigo.

†First choice.

‡Second choice

TABLE 2. *Present-Day Usage of Sulfonamides and Antibiotics in Infections due to Nonhemolytic or Alpha Streptococci and Other Organisms.**

DISEASE	AGENT
Subacute bacterial endocarditis	Penicillin G
Pneumococcal infections	Sulfadiazine and derivatives†; penicillin G.‡
Pneumonia	Sulfadiazine and derivatives†; penicillin G.‡
Meningitis	Sulfadiazine and derivatives combined with penicillin G
Peritonitis	Sulfadiazine and derivatives combined with penicillin G
Otitis media	Sulfadiazine and derivatives combined with penicillin G
Mastoiditis	Sulfadiazine and derivatives combined with penicillin G
Sinusitis	Sulfadiazine and derivatives combined with penicillin G
Meningococcal infections	Sulfadiazine and derivatives combined with penicillin G
Gonococcal infections	Sulfadiazine and derivatives‡; penicillin G.†
Staphylococcal infections	Sulfadiazine and derivatives‡; penicillin G.†
Escherichia coli tissue infections	Sulfadiazine and derivatives†; streptomycin.‡
Gas gangrene	Sulfadiazine and derivatives combined with penicillin G
Cholera	Sulfadiazine and derivatives
Tularemia	Streptomycin
Tuberculosis (selected cases)	Streptomycin
Influenzal meningitis	Sulfadiazine and derivatives combined with streptomycin
Plague	Sulfadiazine and derivatives
Infections due to Friedländer bacillus	Sulfadiazine and derivatives combined with streptomycin

*Indications are for oral and parenteral use only. It will be noted that sulfaguanidine and similar sulfonamide derivatives should not be used in the infections listed. The drugs are contraindicated in the infections in which their use is not recommended.

†First choice.

‡Second choice.

when indicated if members of the diazine group of sulfonamides are not available. "Sulfaguanidine and other sulfonamides" may be considered to include sulfasuxidine and sulfaphthalidine. In all severe cases of infectious diseases that respond to more than one of these agents, a combination of the two most effective agents should be used.

TABLE 3. *Present-Day Usage of Sulfonamides and Antibiotics in Various Diseases.**

DISEASE	AGENT
Bacillary dysentery	Sulfadiazine and derivatives†; sulfaguanidine and other sulfonamides.‡
Brucellosis	Sulfadiazine and derivatives (?)†; streptomycin (?)‡; sulfadiazine and derivatives combined with streptomycin.
Typhoid fever	—
Salmonella infections	—
Chancroid	Sulfadiazine and derivatives
Urinary-tract infections:	
Aerobacter aerogenes	Sulfadiazine and derivatives†; streptomycin.‡
Esch. coli	Sulfadiazine and derivatives†; streptomycin.‡
Pseudomonas aeruginosa	Sulfadiazine and derivatives†; streptomycin.‡
Proteus vulgaris	Sulfadiazine and derivatives†; streptomycin.‡
Actinomycosis	Sulfadiazine and derivatives‡; penicillin G.†
Anthrax	Sulfadiazine and derivatives‡; streptomycin.†
Trachoma	Sulfadiazine and derivatives
Lymphopathia venereum	Sulfadiazine and derivatives
Ulcerative colitis	Sulfaguanidine and other sulfonamides(?)
Psittacosis	Penicillin G (?)
Dermatitis herpetiformis	Sulfapyridine
Influenza	—
Common cold	—
Rheumatic fever (prophylaxis only)	Sulfadiazine and derivatives
Surgical bowel conditions (preoperative)	Penicillin G
Syphilis	Penicillin G
Yaws	Penicillin G

*Indications are for oral and parenteral use only. The drugs are contraindicated in the infections in which their use is not recommended.

†First choice.

‡Second choice.

Directions regarding dosage are contained in New and Nonofficial Remedies, to which the physician is referred for such information. Also, it can be said that accurate directions for using these drugs are contained in the package inserts of the brands that have been accepted by the Council on Pharmacy and Chemistry of the American Medical Association.

Table 4 outlines the incidence of important toxic reactions noted in the course of sulfonamide therapy. It is obvious from the data presented that sulfadiazine is the least toxic of the four drugs listed. Although comparable figures are not readily available, sulfamerazine and sulfapyrazine appear to be somewhat less toxic than sulfadiazine.

Toxic reactions have also been observed after the administration of the antibiotics. As experience with penicillin has increased, toxic reactions, especially those of the urticarial and dermal type, have become more frequent. All varieties from mild erythematous rashes to dermatitis exfoliativa have been noted.

The vertigo and impairment of hearing which has been observed in the course of streptomycin therapy appears to be permanent in certain cases.

The symptoms of vertigo and deafness rarely occur before the fourth day of streptomycin therapy. Patients should be carefully examined each day for symptoms and signs of eight-nerve involvement. Skin rashes and urticarial reactions similar to those seen in the course of penicillin therapy have also been noted after streptomycin administration.

TABLE 4. *Incidence of Important Toxic Reactions in the Course of Sulfonamide Therapy in Adult Patients.**

REACTION	SULFANILAMIDE		SULFAPYRIDINE		SULFATHIAZOLE		SULFADIAZINE	
	NO.	PER-CENTAGE	NO.	PER-CENTAGE	NO.	PER-CENTAGE	NO.	PER-CENTAGE
Fever	2910	5.0	2421	3.1	1316	6.0	4194	1.6
Rash	3066	2.2	3171	2.0	1651	5.2	5137	1.3
Acute hemolytic anemia	1630	2.0	2363	1.1	Very rare		Very rare	
Leukopenia	1000	2.0	2026	2.1	1231	1.6	4601	1.5
Agranulocytosis	1000	0.1	1444	0.8	Rare		Rare	
Hematuria, gross and microscopical	Extremely rare		2899	4.6	1749	4.7	5137	1.7
Oliguria, anuria or azotemia	Extremely rare		2560	2.2	1124	1.1	5137	0.4
Hepatitis	1000	0.6	Rare		Very rare		Very rare	
Averages		11.9		15.9		18.6		6.5

*These figures are based on the reported incidence of toxic reactions, personal experience and, in the instance of sulfadiazine, on data furnished by Finland et al.[2]

It is the author's opinion that the time has come to inveigh against the local use of sulfonamides and the antibiotics. It is considered that the beneficial effects from using these agents externally as dusting powders or in creams, lotions, or salves do not outweigh the risk of sensitizing the patient. Their use parenterally or orally will produce the same results and less likely be the cause of depriving the patient of their possible lifesaving effects in a later serious infection. (New England J. Med., 4 Dec '47 - P. H. Long)

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Procaine Penicillin G (Duracillin): Wallace E. Herrell et al. of the Mayo Clinic have recently carried out a study on duracillin, a procaine salt of penicillin G prepared in the research laboratories of Eli Lilly and Company and intended for use in prolonging an effective concentration of penicillin in the blood.

Procaine penicillin G is a crystalline, nonpyrogenic substance which is prepared by combining one molecule of procaine base, which has a molecular weight of 236, with a molecule of penicillin, which has a molecular weight of 334. The resulting compound contains 41.5 per cent of procaine base. At least 50 per cent of the substance by weight is composed of crystals which are more than 60 microns long. The solubility of this preparation in water at 28° C. is slightly less than 0.7 per cent.

The theoretical potency of the preparation is 1,041 units per milligram. Ninety per cent of this potency is attributable to penicillin G. The actual potency is 940 units per milligram.

At first, the authors used a suspension of procaine penicillin G in cottonseed oil. Each cubic centimeter of this suspension contained 300,000 units of penicillin and 125 mg. of procaine. Later they used a similar suspension of procaine penicillin in sesame oil, and have found that preparation to be superior.

In order to determine the toxicity of this preparation, Walden injected 1,000 units of the preparation in 0.5 c.c. of saline solution into each of fifteen mice. This dose failed to produce any evidence of toxicity. Furthermore, no untoward symptoms were observed after as much as 150,000 units of procaine penicillin in cottonseed oil had been injected into dogs.

The authors injected 1 c.c. of the suspension of the preparation in cottonseed oil into a rabbit. Periodic examination did not disclose any induration at the site of injection. Six weeks after the preparation was administered, necropsy did not disclose any evidence of irritation or any residual oil.

In ten cases in which there was no evidence of impairment of renal function, the authors administered a single intramuscular injection of the oil suspension of this substance which contained 300,000 units of penicillin per cubic centimeter. Some of the patients were ambulatory while others were nonambulatory. The injections were made in the upper outer quadrant of the buttocks. At the onset of these studies, it was necessary to use an 18-gauge intramuscular needle but as the preparation was improved the material could be withdrawn satisfactorily from the ampules and injected by using a 20-gauge intramuscular needle. If the ampule containing the stock solution is warmed by holding it in the hand, the material flows readily. Since procaine penicillin has a tendency to separate from the oil used in the suspension, it is necessary to shake the ampule vigorously while holding it in the hand. As is true when the Romansky method is used for intramuscular injection, it is important not to massage the site of injection.

From the results of the blood studies that were made, it would appear that an effective therapeutic concentration of penicillin in the blood is easily obtained for at least 24 hours when this material is used. In only one instance was there failure to obtain evidence of activity at the end of 24 hours. In that instance, the control titration showed that the endpoint, or the least amount detectable with the test was 0.06 units per cubic centimeter. Had the endpoint been 0.03 units per cubic centimeter, as it usually was, activity might have been detectable. It is interesting that all of four specimens obtained at the end of 27 hours showed adequate therapeutic penicillin activity. At the end of 30 hours the blood of one of three patients still contained 0.06 units per cubic centimeter.

Except for the slight amount of pain incident to making the intramuscular injection, in no instance has there been any evidence of local irritation and soreness or pain after the injection of this material. This suggests that the procaine has a twofold effect: (1) it prolongs the action of the penicillin and (2) it has an anesthetic effect.

The oil suspension of procaine penicillin has been used in the treatment of ten additional patients suffering from a variety of infections. The results were the same as those which would be expected if any other form of adequate penicillin therapy had been employed. The conditions treated included septic sore throat, pneumonia, and infections of the skin and soft tissues such as lymphangitis, carbuncle, and so forth. In this group of cases, no toxic reactions have been encountered. There is some evidence to suggest that the material may have advantages over the other methods previously available for prolongation of action of penicillin. More extensive clinical studies are under way and will form the basis of a subsequent report. (Proc. Staff Meet., Mayo Clinic, 10 Dec '47)

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Clinical Observations on the Use of Thephorin (NU-1504), a New Anti-Histamine Agent: Thephorin is a new antihistamine agent, originally known as NU-1504. It belongs to a heretofore unknown class of compounds and is a polycyclic amine, the empiric formula of which $C_{19}H_{19}N$ (2 methyl-9-phenyl-tetrahydro-1-pyridindene). The tartrate which the authors have used in this study is soluble in water and its pH is 5.

Studies in animals have demonstrated the antagonism of this substance to histamine. Administration of thephorin results in (1) abolition of histamine-induced contraction in the isolated guinea pig intestine; (2) relaxation of spasm in the rabbit intestine induced by the action of acetylcholine or barium; (3) prevention of bronchiolar contraction and convulsions in guinea pigs exposed to histamine spray; (4) prevention of the hypotensive effect of histamine given intravenously in cats; (5) reduction in size of wheals produced by intradermal injection of histamine into rabbits or human subjects, and (6) reduction of histamine-induced increased capillary permeability. Studies on toxicity show that the dose of thephorin required to cause death of 50 per cent of animals is almost exactly that of benadryl but that thephorin is less toxic than pyribenzamine. There is no evidence of chronic toxicity in animals.

The purpose of this study was to investigate the use of this agent in subjects with symptoms thought to be due, in whole or in part, to the release of H substance. For the most part, these patients either had failed to respond to other forms of therapy or had been required to discontinue other therapeutic agents because of the production of toxic symptoms. Frequently, in these patients, pyribenzamine had caused gastro-intestinal symptoms and benadryl had caused hypnotic symptoms. The oral preparation that was supplied in the form of a 25-mg. tablet was used. The average daily dose was 100 mg., the maximum being 200 mg. and the minimum, 25 mg. To date, 62 patients have been treated with thephorin. The groups studied and the results obtained are shown in the table on the following page.

Diagnosis	Cases	Results		
		Excellent	50 per cent relief	No relief
Hay fever	22	17	4	1
Vasomotor rhinitis	11	7	0	4
Cold allergy	6	5	0	1
Acute urticaria	3	1	0	2
Chronic urticaria	3	0	0	3
Histaminic cephalgia (atypical)	9	2	0	7
Migraine	4	0	0	4
Meniere's syndrome	1	0	0	1
Raynaud's disease	1	1	0	0
Dermographia	1	0	1	0
Erythromelalgia	1	0	1	0
Total	62	33	6	23

The results of this study seem to indicate that thephorin is a useful drug for treatment in certain types of clinical problems in which the etiologic factor is probably the release of H substance. Because only a limited number of patients have been studied definite conclusions cannot be drawn. However, the small dosage required for the control of symptoms and the uniform absence of toxic manifestations seem to be the outstanding advantages of this agent over other antihistamine agents. (Proc. Staff Meet., Mayo Clinic, 10 Dec '47 - J. L. Reynolds and B. T. Horton)

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Capillary Fragility and Capillary Permeability in Relation to Retinal Hemorrhage: The pathogenesis of retinal hemorrhage is frequently obscure. There is at least a possibility that certain of the cases may be due to an alteration in the capillary wall which may be present throughout the body, although obvious lesions may appear only in the retina. In an attempt to explore this possibility, tests intended to demonstrate increase in capillary fragility and permeability in the cutaneous capillaries were carried out in a series of patients suffering from retinal hemorrhage. Increase in capillary fragility would be expected to cause hemorrhage primarily in vessels of capillary type. The retinal capillaries would probably share in any capillary change occurring generally.

Since the drug rutin has been shown to decrease capillary fragility when tested in the cutaneous capillaries, and also more recently to have a beneficial effect on increased capillary permeability, a clinical study of its effect on the recurrence of retinal hemorrhage was undertaken.

Two separate groups of patients were studied. One group consisted of 47 subjects with recent retinal hemorrhage who were referred from other dispensaries of the hospital (University of Pennsylvania) to a special dispensary set up for this study. (This group will be subsequently referred to as the dispensary group or dispensary series.) The second group consisted of 32 patients with retinal hemorrhage referred as private patients to one of the authors.

The nature and use of rutin have been described elsewhere by Griffith et al. and Shanno. In general, the initial dosage was 60 mg. per day (20 mg. 3 times a day) and tests for capillary fragility and permeability, one or both depending on what findings were originally abnormal, were repeated in six weeks. The dosage of rutin was increased up to about 400 mg. per day as long as either test remained abnormal, but was held constant when both tests were normal. Ninety per cent of the subjects studied were given 180 mg. per day or less.

Of the 47 patients in the dispensary group 37 were followed for from 6 weeks to 13 months. Of the 32 patients in the private series 15 were followed for a period of from 6 to 51 months, averaging 13 months.

From the results obtained, the authors concluded that a considerable number of patients with retinal hemorrhage have an associated generalized capillary abnormality, as shown by abnormal response to tests for capillary fragility and permeability carried out on the vessels of the skin. The present series showed about 75 per cent of such incidence for either one or both tests, and this is considered significant since these tests are uniformly negative in perfectly normal individuals. Recurrent retinal hemorrhage, occurring during the period of study, was usually but not invariably associated with either increased capillary fragility or permeability, as shown by the tests.

In the series studied, rutin therapy was followed by return of tests to normal in about half of the dispensary group and in about 70 per cent of the private group and such subjects usually, but not invariably, failed to develop further retinal hemorrhage. Considering the number of cases, the period of follow-up, and the scatter of results, final conclusions cannot be drawn, but it is at least suggestive that rutin, in adequate dosage and given over a long enough period, may be of value in preventing further retinal hemorrhage in that group of patients in whom the initial hemorrhage was associated with a generalized capillary fault. (Am. J. Ophth., Dec. '47 - R. L. Shanno et al.)

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Habitat of Endameba Gingivalis in Lesions of Periodontoclasia: Many years ago Johns and the author showed that Endameba gingivalis are most numerous at the very bottom of the pyorrhoea pocket. Later Kofoid substantiated, and extended the application of this observation.

Studies of amebas in periodontoclasia have been based largely upon material taken from the lesions around and between teeth in situ. Although dental literature

contains large numbers of illustrations of sections of teeth, including the periodontal tissues in all stages of periodontoclasia, the amebas present usually have been overlooked. Probably this has resulted from the fact that they are located within the bacterial film on the tooth and are not easily recognized in sections prepared in the usual way. Kofoid and Hinshaw reported the distribution of the amebas found at different levels in relation to the calculus in sections of two incisors removed at biopsy.

More recently, employing an entirely different method, the author has been able to ascertain, more accurately, the location and habitat of the parasite in these lesions. The method consists essentially of microscopic study of material removed, under the dissecting microscope with delicate microinstruments, from different locations on extracted teeth which have been stained.

Elsewhere the author has described a previously unrecognized demonstrable line on extracted teeth which indicates the location of the outer border of the epithelial attachment. It is called the "zone of disintegrating epithelial-attachment cuticle" or zdeac. This line not only indicates the location of the outer border of the epithelial attachment, but it also accurately indicates the location, on the tooth, of the very bottom of the periodontoclasia lesion. With the zdeac as a guide, small particles of the soft bacterial film material can be picked from any selected areas and locations at and near the bottom of the lesion.

The Periodontoclasia Lesion. The lesion of periodontoclasia consists of a pocket or space ("pyorrhoea pocket") at various locations about the tooth, and may extend all the way or only part of the way around it. There is much variation in the depth of lesions around different teeth, and that of the lesions at different locations around the same tooth.

On one side of the lesion there is an inflamed suppurating surface of epithelial tissue extending from the gingival margin to the bottom of the lesion. On the opposite side is the tooth which is covered with more or less hard calculus. Attached to the calculus and to the tooth near it, not yet covered with calculus, there is a pad of soft bacterial material consisting of a compact mass, of variable thickness, of stems and filaments extending outward towards the space and downward towards the very bottom of the lesion. This latter has been noted recently by Box, not, however, with any reference to amebas present.

The outer part of the pad attached to the tooth consists largely of radiating filaments which protrude at the surface as a thick-set carpet-like pile of growing, branching, and fruiting stems. It is possible that the compact portion of the baterial pad attached to the tooth may consist of several different kinds of organisms of this type. However, the fruiting heads on the surface and the stems that can be focused deeper in, conform in structure, in most instances, to Leptothrix falciformis. This organism was first described in material from around teeth by Buest and given the name L. falciformis, because of the scythe- or blade-shaped

conidia produced on the fruiting branches. These conidia or spore bearing curved to straight rods of varying size radiate, at an angle, from the central stalk, which is also surrounded by a large amount of jelly-like material in which the falciforms are imbedded.

Association of the Amebas with Leptotrichia and their Distribution. Intimate association of E. gingivalis with filamentous bacterial material has been observed. Goodrich and Mosely found that these amebas are in greatest numbers on the under side of the tartar ridge. They claim that the parasites do not burrow into the tissues of the gum but often between the terminal branches of the leptotrichia which are found in abundance in the pyorrhoea lesion.

The space between the leptotrichial bed on the one side and the inflamed epithelial wall on the other, contains inflammatory tissue exudate, large numbers of bacteria of many varieties, spirochetes, and usually some amebas which have come out from their bed to their feeding ground where there are abundant pus cells upon which they feed. After feeding the parasites usually withdraw into the leptotrichial bed for safety and protection. Those that venture too far away from the bed into the open space are unable to return and are swept out with the pus, especially when it is squeezed out by pressure upon the tooth in chewing, biting, etc.

The parasites are found scattered among the branches and fruiting heads of the growth that makes up the bacterial pad. The individual parasite not only burrows between the different elements - stems, filaments, falciforms - making up the outer surface, but apparently it also burrows about in the abundant jelly-like material imbedding these elements. In studying several hundred such specimens, the author has often observed several amebas clustered about a stalk and especially in the fork where a large stalk apparently divides into 2 smaller ones. For the most part, however, they are found separate and not in direct contact with each other. (Proc. Soc. Exper. Biol. and Med., Oct. '47 - C. C. Bass)

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Indirect Root Resection: In an article by George C. Hare in the September 1947 issue of the Journal of Endodontia, a technic is described to save a tooth which has a periapical or pulpal involvement following the placement of an anterior jacket crown, a bridge abutment with post or pins, a cast gold crown, or any other restoration which precludes the possibility of entering the pulp chamber and root canal by the usual coronal approach.

The first requisite is adequate anesthesia (the author states that he obtains excellent results with monocaine 1.5 per cent with 1:100,000 epinephrine), since the operation is longer than the usual root resection and periapical curettage. Also of prime importance is an ample incision, so that the flap may be retracted well away from the actual area of operation.

The procedure is as follows:

1. Penetration of the bone to the periapical area may be accomplished either by hand instruments or surgical burs. The completed access must be larger than for the usual direct resection, and should present a large saucer-shaped depression rather than a deep, cup-shaped space.

2. With suitable curettes remove all granulation tissue and irrigate the area with normal saline solution. An aspirator is almost a necessity for this operation.

3. Using a No. 560 crosscut fissure bur, cut the root apex at an angle of 45 degrees, so as to bring the root canal into direct vision.

4. Bend Style D files, from Nos. 1 to 5, at right angles so that four or five millimeters may enter the root canal from the cut apex, and carefully open the canal by progressive steps.

5. When the canal is open to the No. 3 file size, introduce hydrogen peroxide by means of a small pipette (made by fusing a 1-cm. length of an iridio-platinum needle into the end of a glass medicine dropper). The debris loosened by the peroxide is removed by using a 23-gauge Luer-Lok needle on the aspirator point. The use of barbed broaches and succeedingly larger files and repetition of the peroxide-aspirator process are carried out until a No. 5 file enters the canal smoothly. The smoothing of the dentinal wall is completed by dipping the file in phenolsulfonic acid, rubbing the inner wall of the canal, and neutralizing the acid with sodium bicarbonate.

6. Next, a silver point (No. 4 or 5) is cut in lengths of four or five millimeters. These points are conical in shape, and various sections are tried in the canal until one is found which fits so snugly that difficulty is experienced in withdrawing it by means of cotton pliers.

7. Dry the area thoroughly and, with a bent smooth broach, pump root-canal sealing-cement into the canal. Roll the selected section of silver point in the cement and seat it firmly in place. Lay a flat dental chisel over the part of the point extending beyond the canal and with a gold foil mallet give a sharp tap on the flat surface. In other words, rivet the silver point to place. Should there still be excess, this may be cut flush with the cut apex by running a 560 crosscut fissure bur in reverse so that the action of the bur tends further to seat the point rather than to pull it out of the root canal. Smooth further with burnishers.

8. Irrigate the area thoroughly to remove any debris or granulation tissue, and blow in powdered penicillin and sulfanilamide before closing and carefully suturing the flap to place.

This technic of "indirect resection" gives the dentist an excellent means of performing a periapical curettage, apicoectomy, and root canal filling without damaging, marring, or removing a previously placed restoration. (Naval Dental School, National Naval Medical Center, Bethesda, Md.)

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Experiences with a Bone Bank: The method of preserving human bone in a fresh state by means of refrigeration for later use in various operations upon

the bones and joints has been used by the author and colleagues on the Orthopedic Service of the Hospital for Special Surgery in New York since April, 1946, and has demonstrated its value.

On any active hospital orthopedic service there is constantly need of bone to be used as transplants in many different kinds of operations including arthrodesis of the various joints, surgical treatment of ununited fractures and filling of bone cavities in various types of benign bone tumors and cysts or in various conditions in which excision of bone is required. Until now it has been necessary to obtain bone for such purposes by supplementary operations generally upon the iliac crest or tibia which necessitate prolonging the time of operation, add to the operative risk, and certainly increase the patient's discomfort. Not infrequently, the bone defect created by the removal of the graft, often in the tibia, weakens the bone to such an extent that fracture takes place at some later period.

On the other hand, many orthopedic operations such as osteotomies of the feet or of the bones of the extremities to correct deformities or certain types of arthroplasty necessitate the excision of considerable sections of healthy bone which until now have been discarded as of no value.

It seemed useful to attempt to preserve these fragments of bone for later use as surgical transplants, and from earlier attempts and the reports of preservation of other tissues such as eyes, refrigeration seemed to offer the simplest and best method. A deep freeze unit was installed and the bone was transferred to a sterile sealed jar at the operating table and maintained at a temperature of between minus 10° and minus 20° F. No special effort was made to keep the tissue moist such as by immersing it in Ringer's solution or citrated blood because it was frozen while still moist and thus preserved its own fluids. Cultures from the bone were taken at the time of bottling and the only other precautions were a Kline test on the blood of the donor to rule out syphilis and a careful check of the patient's history to rule out malaria, hepatitis, or other recent acute infection. Accurate records were kept of the source of the material, the length of refrigeration and the later results after transplantation. The author and colleagues have constantly had in mind the need of adding to their supply of preserved bone and have sought to add to their stock by taking bone from all available sources and particularly from the iliac crest in operations upon the hip when this would not be harmful to the patients.

This preserved bone obtained from 40 different donors has been used for transplantation in 30 surgical operations upon 25 different individuals during the past year. The longest period between the time of removal of the bone and its implantation was 89 days, and the shortest one day. The average period of preservation of all the bone used was 42 days. No infections or foreign body reactions occurred, and in every case the wound healed by primary intention and remained healed. In no case has there been any sloughing of the preserved bone. Because all of the specimens of preserved bone were small it was not possible to use them in any form but that of small chips, and these chips were used to pack bone cavities or to reinforce various types of fusion operations, especially of the spine. Preferably the bone should be withdrawn from the

bank several hours in advance of the time it is to be used in order to allow it to thaw out, but in several cases the need for its use had not been foreseen, and it was necessary to use it in the frozen state. No difficulty was encountered in these cases, however, and it is probable that the process of preparing the fragments for use by chopping them up in small bits gave enough time for them to thaw out.

The various conditions and operations in which the bone was used are shown in the adjoining table. Of particular interest were the two cases of chronic osteomyelitis with sinuses, one at the lower end of the femur and the other at the lower end of the tibia. In both there were large cavities in the bone which it was not possible to treat by the ordinary method of extensive saucerization and skin grafting or plastic closure of skin flaps. The amount of drainage was small and serous in character. Careful debridement was done of the sinus and of the walls of the bone cavity exposing healthy bleeding bone. The cavity was washed out with saline, packed solidly with bone chips, and then skin flaps were mobilized and closed. The limbs were immobilized in plaster for 4 weeks. Healing occurred by primary intention and the wounds have remained healed for follow-up periods of 3 and 6 months respectively. In one of these cases the bone used had been preserved for 90 days and in the other, 4 days. The uneventful healing in these two cases seemed to prove the absence of any foreign body reaction of the host tissues to the preserved bone.

	Cases	Number of Operations
Spine fusions		
For scoliosis	7	12
For T. B. spondylitis	2	2
For congenital paraplegia	1	1
For spina bifida and spondylolisthesis	1	1
For osteochondroma of spine	1	1
For lumbo-sacral instability	1	1
Wrist fusions	2	2
Curettage and packing of bone cavities		
For osteitis fibrosa cystica		
of humerus	1	1
of femur	1	1
For fibrous dysplasia of femur	1	1
For enchondroma		
of femur	1	1
of phalanx	1	1
For hemangioma of upper ulna	1	1
Excision of osteoid osteoma of tibia and filling defect with bone chips	2	2
Débridement of chronic osteomyelitic cavities, packing with bone chips and primary closure		
of femur	1	1
of tibia	1	1
	25	30

From a clinical standpoint the results of the use of preserved homologous bone have been entirely satisfactory. In all cases its behavior seemed to be identical to that of fresh autogenous bone. Bone cavities and defects became obliterated, and the fusions became solid.

There was one failure in a case of spinal fusion for scoliosis where banked bone was used. Pseudarthrosis was discovered 4 months after operation. This patient was reoperated upon and complete healing of the banked bone was found to have taken place everywhere except at one level where there was a line of pseudarthrosis. This area was excised and re-fused. Examination of the excised specimen showed the pseudarthrosis lined by cartilaginous surfaces with the adjacent bone showing all the appearance of normal healing.

The author's experience with the use of refrigerated bone and that of Inclan, and of Busch and Garber who have conducted similar experiments show that from a clinical standpoint such bone behaves in every way similarly to fresh autogenous bone. This raises the question of how such bone acts and whether from a histologic examination of the tissues the healing is also similar.

The author recovered specimens both of fresh autogenous bone and refrigerated bone which were implanted in human spines for the purpose of promoting fusion at a varying number of weeks postoperatively. These were studied and compared with each other by Dr. Milton Helpern, Pathologist at the Hospital for Special Surgery, as well as by the author. No evidence that the cells in the bone transplants survived in either case was found. The lacunar and interosseous spaces of the bone transplants, whether fresh or refrigerated, were uniformly empty of living cells in the early stages of healing, but there soon occurred an invasion of fibroblasts and blood vessels followed by active absorption of the dead trabeculae with large numbers of osteoclasts present. This process appeared to develop from the periphery of the transplant and then to penetrate into the interior. From 3 to 4 weeks after transplantation, active new bone formation could be seen adjacent to the old trabeculae with both osteoid and osseous tissue present and many osteoblasts arranged about the latter. In other words, the healing process seemed comparable in both the fresh autogenous grafts and the refrigerated bone grafts and whether the material was homologous or autogenous seemed to make no difference.

Sections of refrigerated bone were examined after varying periods of preservation. The cellular tissue appeared intact and had the same staining reaction as that of fresh bone. These views conform to those of the many other students of the function of bone transplants who have concluded that the grafts die and are then transformed into living bone by the processes of resorption and osteogenesis of the host's tissue. In fresh grafts some cellular elements may survive, but it is considered that these are few and not of much importance.

The author believes that the advantages of the use of refrigerated bone lie in the fact that such bone is preserved in a fresh state, and therefore that the processes of invasion, resorption and transformation take place more easily than with boiled or dried bone in which the organic elements are dried or coagulated as pointed out by Orrell. Whether or not sterile refrigerated heterogeneous bone would serve as well as homologous bone remains to be determined. Obviously there is a large field for further experimentation to answer this and other questions.

Although the organization of a bone bank on a small scale is possible and desirable in every hospital with an active bone and joint service, it seems that endeavors should be made toward the larger goal of supplying the needs of all surgeons requiring bone for every type of transplantation and that a leaf should be taken from the book of experience of the Manhattan Eye Bank in a plan to organize a bone bank on a community level. In this way the cooperation of all persons both medical and lay would be obtained, for the service would be available to all. It probably could subsist on a system of voluntary contributions from the recipients in the same manner as the Manhattan Eye Bank. (Ann. Surg., Dec. '47 - P. D. Wilson)

Deficiencies Concerning Health Records: From correspondence recently received in the Bureau of Medicine and Surgery, it is evident that many deficiencies exist in the maintenance and care of Health Records.

A great number of men who have not been given the prescribed immunizing injections and furnished with NavMed-585 (U. S. Navy Immunization Record) are being transferred to vessels of the fleet and extracontinental stations. Out of 100 men received aboard one ship during October, 75 required immunizations upon arrival. Some Health Records, upon receipt, have been found to contain little more than a record of the examination for transfer. Almost all the records received on board one of the cruisers during a period of several months lacked at least one fundamental as set forth in the Manual of the Medical Department. Among these discrepancies were no record of blood type, no finger print on H-2, and certain H forms missing altogether. In some instances, pages from health records have been found in a person's Service Record.

All personnel received by transfer should be interviewed promptly after reporting aboard a ship or station by an appropriate representative of the Medical Department for the purpose of reviewing the contents and accuracy of Health Record entries. The recorded rate or rank, name and address of beneficiary, marks and scars, the status of immunizations, and other important entries should be verified and corrected where indicated. The interview affords opportunity for discussion of any entries that may appear to be of particular medical interest. If there is a dental officer aboard, each person with his health record should be routed through the Dental Department before leaving the sick bay or dispensary area. For those reporting without a Health Record, or otherwise found not to have one, a skeletal record containing at least the NavMed H-2 (Physical Examination), NavMed H-4 (Dental Record), and NavMed H-8 (Medical History) should be made out immediately. Efforts should be made to locate a missing record promptly and if a missing record is not soon located, the skeletal record already made up should be completed.

It is essential that all activities of the Medical Department in any way concerned with the maintenance and handling of Health Records exercise diligence in carrying out the instructions thereon contained in the Manual of the Medical Department and in the various existing directives. The proper maintenance of Health Records is one of the primary duties and responsibilities of the senior representative of the Medical Department of a ship or station. (PQ & MR Div., BuMed)

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Dental Reserve Officers' Training Duty: Training duty will be available to a limited number of reserve officers at the U. S. Naval Dental School, National Naval Medical Center, Bethesda, Maryland, during the period from 19 April to 30 April 1948, inclusive. The total number that can be accommodated has been apportioned among the naval districts.

Included in this training will be lectures and demonstrations in the field of naval dentistry and visits to naval and Marine Corps activities of interest.

Requests for assignment to this training duty should be submitted to the Commandants of the naval districts in which the officers maintain their official residences. Final approval of requests and issuance of orders will depend upon the availability of funds. (Dental Div., BuMed)

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Materiel Division Instructions No. 1 Re Army-Navy Catalog of Medical Materiel: 1. The below listed items are now available for issue on NavMed-4 from medical supply depots. Accordingly, these items shall be deleted from the Addenda to the Army-Navy Catalog of Medical Materiel.

1-124-515 Capsule, Gelatin, Pharmaceutical, No. 3, 100s (not more than one-half usage rate of capsules #2 should be requisitioned).

1-137-550 Chlorobenzene, 1/4 lb. (only activities finding it necessary to preserve insects should requisition).

1-139-300 Chloroquine Disphosphate Tablets, 0.5 Gm. (7-1/2 gr.) 1000s (one bottle is enough to treat 100 malaria cases, order accordingly).

1-167-690 Digitoxin Tablets, 0.2 mg. (1/320 gr.) 100s (not more than 36 bottles per hospital and dispensary on an initial requisition).

1-167-750 Digoxin Tablets, 0.25 mg. (1/240 gr.), 100s (not more than 36 bottles per hospital and dispensary on an initial requisition).

1-231-500 Indigo Carmine Ampuls, 0.8 per cent, 5 c.c., 10s (suggest initial requisition of 20 boxes for hospital - all other activities doing renal function test 2 boxes).

1-272-100 Mercuric Bromide, 1 oz. (suggest initial requisition of four bottles for large laboratories).

1-433-820 Sodium Hippurate, 10 Gm. (suggested initial requisition of twelve units for large laboratories).

1-471-840 Tetracaine Hydrochloride, 0.015 Gm. (1/4 gr.), 10s (not over 36 boxes per hospital initially - all other activities consider anticipated spinal anesthesias).

1-605-845 Insulin Injection, U-80, 10 c.c. (suggest requisition not over 1/2 of past issue rate of insulin, U-20).

3-742-325 Chest Piece, Bracelet Type Stethoscope (for large medical activities).

3-747-900 Stripper, Vein, Mayo, Size 2 (suggest one (1) for each naval hospital).

3-810-690 Tangent Curtain, Folding Type (suggest one (1) for each naval hospital of 1000 beds or more).

4-089-964 Box, Ointment, Tin, 2 oz., 12s (for use of all Medical Department activities).

4-089-970 Box, Ointment, Tin 4 oz., 12s (for use of all Medical Department activities).

4-090-750 Box, Tablet, Nest of 3, 12s (for use by all Medical Department activities, note unit of issue).

4-111-000 Burner, Gas, Radial, Fletcher (hospitals and large laboratories).

4-114-000 Burner, Micro (hospitals and large laboratories).

4-130-015 Cup, Centrifuge, Trunnion, Babcock (hospitals, large laboratories and research units).

4-185-240 Cup, Inclined Duboscq Colorimeter (for hospitals and large laboratories).

4-185-250 Plunger, Inclined Duboscq Colorimeter (for hospitals and large laboratories).

4-193-375 Crucible, Nickel, 250 Ml (naval hospitals of 1000 beds or more and large laboratories).

4-222-200 Dish, Petri, Large (for use of all Medical Department activities).

4-230-250 Extractor, Stopcock (for use of all hospitals and large dispensaries).

4-317-080 Eyepiece, Microscope, Huygenian, Paired, 10x (replacement parts for 4-316-000).

4-357-825 Paper, Filter, Hardened, 240 mm., 100s (for all naval hospitals, hospital ships and large dispensaries).

4-383-175 Coupling, Filter Pump, Threaded (for all naval hospitals and large dispensaries - requisition from Navy Medical Supply Depot, Brooklyn or Oakland only).

4-405-750 Still, Water, Stream Heated, 5 gal. (for use of naval hospitals of 1000 beds or more).

5-000-520 Alginate Compound, 1 oz. (for general issue to dental prosthetic activities).

5-100-650 Bur, Finishing, AHP, No. 200,6s (for issue to all dental activities).

5-101-550 Bur, Finishing, AHP, No. 224, 6s (for issue to all dental activities).

5-103-650 Bur, Finishing, SHP, No. 200, 6s (for issue to all dental activities).

5-105-050 Bur, Finishing, SHP, No. 224, 6s (for issue to all dental activities).

5-115-400 Carver, Wax and Amalgam, Hollenback, No. 1 (for issue to all dental activities).

5-115-425 Carver, Wax and Amalgam, Hollenback No. 2 (for issue to all dental activities).

5-115-450 Carver, Wax and Amalgam, Hollenback, No. 3 (for issue to all dental activities).

5-323-000 Forceps, Tooth Extracting, No. 103 (for issue to all dental activities).

2. Delete the following Stock Numbers and their Nomenclatures from the Addenda to the Army-Navy Catalog of Medical Materiel. These items have previously been reported as available for issue.

Stock No.	Stock No.	Stock No.	Stock No.	Stock No.
1-330-200	3-145-615	3-462-220	3-674-700	4-425-600
2-003-190	3-184-850	3-462-225	4-082-300	7-088-425
3-000-755	3-184-855	3-491-700	4-128-400	7-123-090
3-098-150	3-452-310	3-656-300	4-314-087	
3-103-100	3-452-312	3-667-400	4-365-860	

3. Delete from the description the statement "Navy-Requisition from Naval Medical School, National Naval Medical Center, Bethesda 14, Md.," from the following items listed in the Army-Navy Catalog of Medical Materiel.

Stock No.	Nomenclature
1-592-010	Antiparatyphoid Serum, Bacterial, Diagnostic, "A," 1 c.c.
1-592-050	Antiparatyphoid Serum, Bacterial, Diagnostic, "B," 1 c.c.
1-596-015	Antityphoid Serum, Bacterial, Diagnostic, 1 c.c.
1-598-380	Blood Grouping Serum, Anti-B, 25 Tests
1-598-410	Blood Grouping Serum, Anti-A, 25 Tests
1-598-610	Blood Typing Serum, Anti-Rh_o 20 Tests
1-601-750	Complement, Guinea Pig, Lyophilized, 7 c.c.
1-605-550	Globulin, Stock Solution, 5 c.c.
1-605-710	Hemolytic Amboceptor, Antisheep, 5 c.c.
1-616-560	Typhoid Vaccine, Triple, 50 c.c.
1-610-025	Syphilis Antigen, Complement Fixation Test, 5 c.c. (Available only to Army)

(Materiel Div., BuMed)

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NAVMED-K (Rev. 5-47), Report of Dental Operations and Treatments: NAVMED-K was designed and developed for the purpose of providing the Bureau of Medicine and Surgery with data regarding the dental service. It is required for many purposes, including:

a. Computations and compilations of various treatments and operations.
b. Determining achievement.
c. Estimating efficiency.
d. Planning improvement.
e. Collecting research material.
f. Estimating materiel requirements.
g. Calculation of personnel complements.
h. Comments and recommendations on matters of legislation.

This form is of inestimable value to BuMed. In order that it may be fully effective, it is necessary that the entries which are made in it each month be accurate. The determination of important matters relating to the dental service, to dental personnel, and to the welfare of the Dental Corps frequently depends upon the accuracy of the data compiled from the NAVMED-K (Rev. 5-47). It is expected that dental officers who sign these reports will be able to verify and justify the entries in them whenever they may be requested to do so.

The NAVMED-K (Rev. 5-47) must be submitted each month by the responsible dental officer of each dental activity. In situations where the dental departments of receiving stations, Fleet Aircraft Service Squadrons, Night Composite Development Squadrons, and similar commands are operating in the same building or space, the responsible dental officer of each command shall submit a NAVMED-K (Rev. 5-47) for the personnel of the command to which he is attached by virtue

of orders from the Bureau of Naval Personnel or comparable authority. The responsible dental officer of a FASRON is therefore expected to submit a separate report.

It is highly important that the NAVMED-K be submitted to BuMed without delay after the end of each month in order that compilation of the data obtained from it may be completed before reports for the following month are due.

Only the original of this form is required by BuMed. Copies are not desired and should not be forwarded. One copy should be forwarded to the cognizant staff or district dental officer.

Although instructions for accomplishing the NAVMED-K (Rev. 5-47) are contained in paragraph 5112, Manual of the Medical Department, it has been observed in BuMed that interpretations for some entries required in this form vary considerably among the dental officers who make them. The following are the BuMed interpretations for some of these items:

a. OPERATIVE DENTISTRY.

BASE INTERMEDIATE - Any mass of material which is placed under a permanent filling in a tooth for the purpose of protecting the pulp from irritation. This material may be oxyphosphate of zinc or copper cement, oxychloride of zinc cement, zinc oxide and eugenol, baseplate gutta percha, or similar type materials. Applications of silver nitrate solution or phenol solution should not be reported under this item.

FACING, REPLACEMENT OF - Includes replacement of a facing by means of a porcelain facing, porcelain posterior, acrylic resin, silicate cement, or oxyphosphate of zinc cement.

PROPHYLAXIS - Only one entry should be made for each case consisting of all upper and lower teeth, regardless of the number of sittings.

PULP, CAPPING OF - A pulp capping operation usually consists of the application, for the purpose of protecting an exposed pulp, of a material over which another material is placed as an intermediate base. There should be an additional entry (as may be indicated) made under BASE, INTERMEDIATE.

b. ORAL SURGERY.

ABSCESS, INCISION AND DRAINAGE OF - Whenever an abscess is incised and drained, an entry should be made under the item INTRA-ORAL or EXTRA-ORAL, as the case may be, in addition to the entries required for ABSCESS, DENTOALVEOLAR under MISCELLANEOUS TREATMENTS and CASE STATISTICS, which entries it does not duplicate. The entries for the incision and drainage of abscesses should include all types of abscesses so treated, whether they are or are not dentoalveolar abscesses, whereas, the

entries for ABSCESS, DENTOALVEOLAR under MISCELLANEOUS TREATMENTS and CASE STATISTICS should be for this specific type of abscess only.

ALVEOLECTOMY - Only one entry should be made for an alveolectomy of the maxillas or mandible performed for the purpose of preparation for a full or partial denture, regardless of whether the operation was performed in sections or during one or more sittings. In other words, only one entry should be made for one jaw.

ANESTHESIA, ADMINISTRATION OF:

REGIONAL - Only one entry should be made if conduction or infiltration anesthesia is used for extraction and for operation upon or treatment of the maxillas or the mandible during one sitting, irrespective of the number of points of introduction of the anesthetic solution. For example, only one entry should be made under REGIONAL for introduction of anesthetic solution in the region of both inferior dental foramina and both mental foramina regardless of the number of teeth which are extracted or the types of operations which are performed during one sitting. One additional entry should be recorded in the event that conduction or infiltration anesthesia is used for the maxillas during the same sitting regardless of the number of points of introduction of the solution or the operations which are performed. Thus, as a general rule, but one entry would be made concerning anesthesia for one jaw.

FRACTURE, MANDIBULAR, REDUCTION OF - An entry should be made for this item whenever a fracture of the mandible is reduced, in addition to the entries which are required for FRACTURE, BONE, under MISCELLANEOUS TREATMENTS and FRACTURE, MANDIBULAR, under CASE STATISTICS. Only one entry should be made for each case in which reduction is effected during a continuous period of treatment, even though several attempts at reduction be necessary (provided that union of the fragments has not occurred) before obtaining a satisfactory result. However, when, after union of the fragments, refracture becomes necessary, another entry should be made. Only one entry should be made under CASE STATISTICS for a current fracture of one jaw.

FRACTURE, MAXILLARY, REDUCTION OF - Essentially the same interpretation applies as for FRACTURE, MANDIBULAR, REDUCTION OF.

FRACTURE, MAXILLO-FACIAL, REDUCTION OF - Essentially the same interpretation applies as for FRACTURE, MANDIBULAR, REDUCTION OF.

GINGIVAL FLAP, EXCISION OF - One entry should be made for each third molar involved in an operation for the removal of a coronal tissue flap. Only one entry should be made for the removal of uncomplicated, simple, hypertrophied tissue flaps involving other teeth than third molars, even though more than one gingival flap is excised during a sitting. So, with the exception that third molar involvements are counted singly, only one flap excision should be counted for one jaw.

GINGIVECTOMY - Only one entry should be made for this item for either the maxillas or the mandible regardless of whether the operation was performed in sections or during several sittings. Two entries should be made if gingivectomy was performed of both maxillary and mandibular tissues during the same sitting.

c. EXODONTIA.

TOOTH, IMPACTED, REMOVAL OF - Removal of any type of impacted tooth, including those removed by simple or radical surgical methods.

TOOTH, UNERUPTED, REMOVAL OF - An unerupted tooth is differentiated from an impacted tooth in that the former is in normal position to erupt. It is never held in an unerupted position by being impacted against an adjacent tooth. Removal of an unerupted tooth should be recorded under this item irrespective of the manner of removal.

TOOTH, SURGICAL REMOVAL OF - The removal of an erupted, unimpacted tooth or a tooth root by surgical means. The removal of impacted or unerupted teeth should not be recorded under this item even though they may have been removed by surgical methods.

d. PROSTHETIC DENTISTRY.

Information reaching BuMed indicates that the fabrication of inlays, crowns, bridges, and dentures, and the rebasing, repair, and reconstruction of dentures are being accomplished at dental activities for which dental prosthetic facilities have not been authorized by the Bureau. No prosthetic dental procedures may be undertaken at dental activities without authorization, except that limited prosthetic dental treatment may be accomplished by activities having the "Dental Prosthetic Kit, Emergency Denture Repair" (Stock Number 9-182-750, Army-Navy Catalog of Medical Materiel). A NAVMED-L, REPORT OF PROSTHETIC DENTAL TREATMENT should be accomplished and submitted for each case, in accordance with current instructions, by all dental activities which accomplish any dental prosthetic operations or restorations that are required to be reported under PROSTHETIC DENTISTRY, whether the dental activity has or has not a dental prosthetic facility authorized by BuMed. The notation "Dental Prosthetic facility not authorized" should be entered under "REMARKS" or "OTHER (DESCRIBE)" of the NAVMED-L by all dental activities which do not have dental prosthetic facilities authorized by BuMed. Activities which have the "Dental Prosthetic Kit, Emergency Denture Repair" are not considered to have dental prosthetic facilities authorized by BuMed, since they are equipped to accomplish only limited dental prosthetic treatment. It is expected, however, that they submit the NAVMED-L for dental prosthetic procedures which are accomplished. BuMed Circular Letter No. 46-25 is being modified accordingly.

TEETH, NUMBER IN PARTIAL DENTURES - The actual number of porcelain or acrylic artificial teeth restored in partial dentures. If one artificial tooth replaces two natural teeth, only one should be recorded.

DENTURE, FULL, RECONSTRUCTION OF - In a reconstructed full denture, all of the denture base material is replaced, the original artificial teeth being used.

DENTURE, PARTIAL, RECONSTRUCTION OF - In a reconstructed partial denture, the original teeth and metal frame work and clasps are utilized. Metal parts may be modified, adjusted or repaired. The acrylic denture material is renewed.

ADJUSTMENTS, FULL AND PARTIAL DENTURES - An entry should be made for each sitting when adjustments are made to a denture. If adjustments are made to both an upper denture and a lower denture during one sitting, two adjustments should be recorded.

e. MISCELLANEOUS TREATMENTS - Each treatment should be recorded for the items under this heading. It is frequently observed that the number of treatments recorded for a specific condition equals or is less than the number of cases for the identical condition reported under CASE STATISTICS, which does not seem to be reasonable for such items as ABSCESS, DENTOALVEOLAR; CELLULITIS; GINGIVITIS, VINCENT'S; PERIODONTOCLASIA, etc. The entries for the items under MISCELLANEOUS TREATMENTS should be the actual number of treatments which are administered for the cases which are reported under CASE STATISTICS. Treatments recorded can be expected to be much more numerous than the cases reported.

f. PROSTHETIC CASES SUMMARY.

PATIENTS WHOSE TREATMENT WAS COMPLETED - To be reported only by the dental department which actually fabricates and delivers the restoration.

PATIENTS AWAITING TREATMENT AT END OF MONTH - Their cases should be reported by: (1) The dental department of the command to which they are attached if it has a dental prosthetic facility.

(2) The dental department of the command to which they are attached if it does not have a dental prosthetic facility and if the patients are waiting at their places of duty for dental prosthetic treatment to be accomplished elsewhere.

(3) The dental service of a naval hospital, for hospital patients and staff who require dental prosthetic treatment, whether or not there is a dental prosthetic facility in the dental service of the hospital.

(4) The dental department to which patients apply for dental prosthetic treatment if there is no dental department in the command to which they are attached.

(5) The dental department to which patients apply for dental prosthetic treatment if they are in an inactive duty status.

g. DENTAL PERSONNEL STATISTICS. (Attached on date of report)

Dental personnel who are on board for additional duty only should not be included under DENTAL OFFICERS; OTHER OFFICERS; DENTAL TECHNICIANS, GENERAL; DENTAL TECHNICIANS, PROSTHETIC; OTHER ENLISTED ASSISTANTS; and CIVILIAN EMPLOYEES if they are primarily attached to or employed at another command. They may be accounted for by an entry under REMARKS as follows: "One dental officer on board 20 days additional duty." A notation should also be made under REMARKS when a dental officer, regularly attached, has additional duty elsewhere, as follows: "One day additional duty each week U.S.N. Powder Factory, Indian Head, Maryland." When a dental officer submits a NAVMED-K (Rev. 5-47) for a command to which he is not primarily attached but where he performs additional duty, the entries under DENTAL PERSONNEL STATISTICS should not include personnel who are primarily attached to another command. He should include a statement under REMARKS which will indicate that the report is submitted for additional duty. No entries should be made under DENTAL PERSONNEL STATISTICS in the supplementary NAVMED-K (Rev. 5-47) submitted for Veterans Administration Patients, Army Personnel, Foreign Military Personnel, or similar categories.

Numerous entries in NAVMED-K (Rev. 5-47) are erroneous, irrelevant, inconsequential, based on misconceptions, or, are not desirable for other reasons. Some of them are:

a. Incorrect totals due to errors in addition.
b. Inclusion of items for emergency dental treatment of civilians for humanitarian reasons.
c. Requests for corrections by the Bureau to a NAVMED-K (Rev. 5-47) previously submitted. It is not practicable to make such corrections in BuMed. A revised form should be submitted or the corrections should be incorporated in a subsequent report.
d. Notations regarding time or days lost because of inspections or parades. These are normal military functions common to all dental activities, mention of which is unnecessary.
e. Failure to carry all items in the report forward for the activity for the calendar year in the column headed CAL. YEAR TO DATE.

(Dental Div., BuMed)

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Shortage of Medical Personnel: Circular Letter 48-5, page 47 contains information which is of vital importance to all personnel of the Medical Department of the Navy.

All Officers of the Medical Department to Have a Copy of Manual of the Medical Department and Bulletin of Bureau of Medicine and Surgery Circular Letters: See page 44 for BuMed Circular Letter 48-2 which contains instructions concerning this subject.

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Appointment to Permanent Commissioned Rank Not Above That of Captain in the Medical and Dental Corps of the Navy Now Open to Qualified Civilian Doctors of Medicine and Dentistry: Public Law 365 - 80th Congress, in addition to increasing the compensation to medical and dental officers of the Navy, provides, in part, for the original appointment of qualified civilian doctors of medicine and dentistry who are more than 32 years of age to permanent commissioned rank, not above that of captain, in the Medical and Dental Corps of the Navy.

The Chief of Naval Personnel recently authorized the Offices of Naval Officer Procurement to procure these physicians and dentists. The rank to which appointed will be determined by the professional age, experience, and attainments of the applicant. Although applicants may list the rank for which applying, the rank offered will be dependent upon the decision of the board which will review the applications, and will, in general, be the rank which will integrate them into the Medical or Dental Corps of the Navy in ranks comparable to their contemporaries who are on active duty.

Those who are interested may obtain complete information from the Office of Naval Officer Procurement nearest their home or by letter to the Bureau of Medicine and Surgery.

Applications from Reserve officers on active duty are to be submitted to BuPers via BuMed, in letter form, forwarding therewith any applicable documents not already on file in their officers' jackets. Reserve officers on inactive duty are to apply as civilians.

Candidates holding a commission in any other branch of the armed services will be required to resign said commission prior to accepting any commission offered under this directive. Due to the rigorous qualifications and selection system for this program, candidates are advised not to resign such commission until notified of their selection for this program.

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Refresher and Short Postgraduate Courses for Dental Officers: The Bureau of Medicine and Surgery desires to provide, insofar as the available funds will permit, refresher and short postgraduate courses in civilian dental colleges. See page 45, Circular Letter 48-4, for information concerning this training.

Op24B/cj
Serial: 702P24 28 November 1947

To: All Ships and Stations

Subj: U. S. Naval Dental Clinic, Guam, M. I. - Establishment of

1. The following activity is hereby established, under a Dental Officer in Command:

U. S. Naval Dental Clinic
Guam, M. I. 2748-380

This activity is under the military command and coordination control of the Commander, U. S. Naval Operating Base, Guam, M. I., and is under the management control of the Bureau of Medicine and Surgery.

2. This activity will comprise the personnel, facilities, allowances, and will assume the functions, of the Dental Department of the U. S. Naval Operating Base, Guam, M. I., which has also been known locally as the "Fleet Dental Clinic, Guam, M. I.". Logistic support for the naval personnel of this activity will continue to be provided, as at present, by the Naval Operating Base, Guam.

3. Bureaus and offices concerned take necessary action.

--SecNav John L. Sullivan

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Op24B/cj
Serial: 720P24 18 December 1947

To: All Ships and Stations

Subj: Offices of Inspectors of Dental Activities, East and West Coasts - Establishment of

1. The following field offices of the Bureau of Medicine and Surgery are hereby established:

Inspector of Dental Activities, USN
East Coast
Federal Office Building
90 Church Street
New York 7, New York 3595-550

Inspector of Dental Activities, USN
West Coast
Federal Office Building
San Francisco 2, California 3595-750

These activities are under the military command and coordination control of the Commandant of the Naval District in which located and are under the management control of the Bureau of Medicine and Surgery.

2. Bureaus and offices concerned take necessary action.

--SecNav John L. Sullivan

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Circular Letter 47-174 18 December 1947

To: Fleet, Force, and Staff Medical Officers (Via Commanders).
DMOs Naval District and River Commands (Via Commandants).
MedOfsCom, NavHosps.

Subj: Report of Progress on Transfer of Reserve Medical Officers to Regular Navy

Ref: (a) BuMed CirLtr No. 46-48 dated 19 Feb 1946.

This letter from the Chief of BuMed states that the subject report which, in accordance with reference (a), was to be submitted monthly until 1 October 1946 now serves no useful purpose and should be discontinued.

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Circular Letter 47-175 23 December 1947

To: MedOfsCom, NavHosps, Cont. U. S.

Subj: Medical and Dental Records, Use of Anatomical Charts in

This letter from the Chief of BuMed requests that certain information concerning clinical record forms be furnished the Bureau for use in connection with an interagency committee which is making an extensive study to develop standard medical and dental records for federal medical and dental services.

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Circular Letter 47-176 26 December 1947

To: All Stations (Continental and Extra-Continental) Having a Representative of the Medical Department Aboard

Subj: Annual Inventory of Motor Vehicles - Preparation and Submission of

Refs: (a) Annual Estimate of Expenditures, Field Activities
(b) BuMed Circular Letter 47-64, dated 16 May 1947
(c) USN Automotive Preventive Maintenance Manual, NavDocks P-6

Encl: 1. (HW) Schedule "1," Inventory of Ambulances and Nonpassenger Carrying Vehicles
2. (HW) Schedule "2," Inventory of Passenger Carrying Vehicles
3. (HW) Schedule "3," Replacement of Ambulances and Nonpassenger Carrying Vehicles, F.Y. 1949
4. (HW) Schedule "4," Replacement of Ambulances and Nonpassenger Carrying Vehicles, F.Y. 1950

This letter from the Chief of BuMed directs the submission of the "Annual Inventory of Motor Vehicles," for the period from 30 June 1947 to 31 December 1947, to reach the Bureau prior to 20 January 1948. The factors are given which serve generally as a basis upon which the replacement of motor vehicles under the cognizance of BuMed is made. Full compliance with instructions contained in references (b) and (c), by responsible Medical Department representatives concerned is directed.

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Circular Letter 48-1 2 January 1948

To: All Ships and Stations

Subj: Procurement of Medical and Dental Books, Policy Regarding

Ref: (a) BuMed C.L. 47-114 of 28 August 1947

1. Reference (a) is hereby cancelled and superseded by this letter.

2. Effective beginning with fiscal year 1949, each medical and dental activity shall submit requirements for standard professional books listed in the Army-Navy Catalog of Medical Materiel direct to the Materiel Division, Bureau of Medicine and Surgery, 84 Sands Street, Brooklyn 1, New York, by requisitions, NavMed 4, during August and February of each fiscal year to reach Materiel Division by 1 September and 1 March. Total Navy semiannual requirements for standard medical and dental books will be determined after all requisitions from the field have been received and procurement then initiated. Delivery to

the requisitioning activities will be accomplished as soon as the books become available from the publisher. Issue will be accomplished through U. S. Naval Medical Supply Depot, Brooklyn, New York.

3. Estimate of funds required for procurement of nonstandard professional medical and dental books (not listed in the Army-Navy Catalog of Medical Materiel) shall be included in annual estimate of expenditures by activities preparing same. Upon approval by the Bureau in the annual estimates, procurement shall be by the requisitioning activity under authority of the annual purchase requisition, subobject 0998. Ships and overseas activities shall procure nonstandard medical and dental books under authority of their annual purchase requisition. Nonstandard medical and dental books shall not be requisitioned from Naval Medical Supply Depots or Materiel Division, Bureau of Medicine and Surgery.

--BuMed C. A. Swanson

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Circular Letter 48-2 5 January 1948

To: All Ships and Stations

Subj: NAVMED-117 (Rev. 1945), Manual of the Medical Department; and NAVMED-937 (Rev. 6-47), Bulletin of Bureau of Medicine and Surgery Circular Letters; Assignment and Custody of

1. Subject publications contain the regulations, instructions, and directives governing the facilities and personnel of the Medical Department of the U. S. Navy. It is necessary that all Medical Department officer personnel be thoroughly familiar with these publications in order to discharge their responsibilities. Therefore, effective immediately, it shall be mandatory that all active duty commissioned and warrant officer personnel of the Medical Department possess and maintain in a current status a personal copy of each of these publications.

2. Ship and station office copies may also be maintained by those activities having a Medical Department representative on board. Office copies, if required, shall be requisitioned on NAVMED-4.

3. Since all Medical Department officer personnel are required to have personal copies, the number of office copies should be kept to a minimum. It is directed that any office copies on hand which are in excess of needs be assigned to the Medical Department officer personnel on board who do not at present have personal copies. If there are any excess office copies still remaining on hand after personal copies have been assigned, they shall be handled as follows:

(a) Manual of the Medical Department - Dispose of the contents and forward the permanent binder and posts to the Bureau.

(b) Bulletin of Bureau of Medicine and Surgery Circular Letters - Return the complete publication to the Bureau.

All ships and stations having a representative of the Medical Department on board shall then inform the Bureau of the exact number of office copies remaining for activity use. Upon receipt of this information, the Bureau's mailing list will be revised accordingly.

4. No report of the transfer of the office copies to personnel will be required from the activity. However, in the near future, a questionnaire will be sent to all Medical Department officer personnel, the completion and return of which will supply the Bureau with all the information needed to furnish all personnel with the required copies or changes without further request. Future changes will be supplied automatically by the Bureau.

5. An exception to the foregoing is made in the case of Nurse Corps officers. It will not be mandatory that Nurse Corps officers have personal copies of subject publications. However, sufficient office copies shall be made available to Chief Nurses for the use of all Nurse Corps officers on board.

6. This letter should be brought to the attention of all Medical Department officer personnel.

--BuMed C. A. Swanson

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Circular Letter 48-3 5 January 1948

To: MedOfCom, U. S. Naval Hospitals
U. S. Naval Medical Center, Guam, M. I.
National Naval Medical Center, Bethesda, Md.

Subj: Fiscal Accounting Positions in Naval Hospitals, Study of

This letter from the Chief of BuMed states that a study of fiscal accounting positions in naval hospitals is being made and requests that certain information be furnished the Bureau by addressees.

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Circular Letter 48-4 5 January 1948

To: Commandants, All Continental Naval Districts and River Naval Commands, and Chief of Naval Air Training.

Attn: District and Staff Dental Officers

Subj: Refresher and Short Postgraduate Courses for Dental Officers

1. It is desired to provide, within the funds available, refresher and short postgraduate courses in civilian dental colleges for as many dental officers as possible. It is therefore requested that District Dental Officers and the Staff Dental Officer of the Potomac River Naval Command keep BuMed informed of all refresher and short postgraduate courses which may be appropriate and available for dental officers of the regular Navy in dental colleges in the continental naval districts and in the area of the Potomac River Naval Command. It will be necessary for them to maintain contact with the dental colleges in order to obtain such information.

2. The following are the specific data desired by BuMed:

a. Subject of course.
b. Name of college or university.
c. Whether course is conducted full time or part time. State days and hours of instruction periods.
d. Date when course will commence.
e. Date when course will end.
f. Whether certificate of accomplishment or other evidence of completion of course will be given.
g. Number of dental officers who will be accepted by the college or university for each course.
h. Itemized cost of course, including tuition, books, instruments, supplies, gowns, rental of equipment and other fees.
i. Total cost of course.

3. After BuMed has received the desired data, commandants of all continental naval districts and river naval commands and the Chief of Naval Air Training will be advised of the courses which BuMed has made available for dental officers over whom they have jurisdiction. It is desired that District and Staff Dental Officers then disseminate the information to all dental officers of the regular Navy in their districts or commands, ascertain which officers desire courses, determine eligibility, and advise on submitting requests to BuMed in conformance with paragraph 1328, Manual of the Medical Department. Dental officers of the regular Navy only are eligible for these courses.

4. In recommending on assignments to courses, District and Staff Dental Officers should consider the number of courses previously received at the expense of the Navy. Officers who have had no courses should be given preference. There is no limitation on the number of refresher or short courses which a dental officer may be given, but, distribution should be equitable.

5. Dental officers will be given official authorization to attend courses so that leave of absence for this purpose will not be necessary. Travel and per diem

expenses will not be authorized. Tuition and other fees will be paid from training funds of the Medical Department of the Navy.

6. Requests for courses of instruction should reach BuMed at least eight weeks before the dates on which the courses will commence.

7. Civilian dental colleges should be advised that a Navy Purchasing Office, usually the one nearest the college, will make contracts for payment of tuition and other fees for courses authorized by BuMed for dental officers. The contracts will call for payment upon completion of the courses.

--BuMed C. A. Swanson

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Circular Letter 48-5 6 January 1948

To: DMO's; MedOffsCom, NavHosps; SMO's, Dispensaries

Subj: Shortage of Medical Personnel

1. During the postwar conversion to a stabilized Navy there will continue to exist an acute shortage of medical personnel, medical officers, nurses and hospital corpsmen. It is anticipated that many of the several hundred V-12 medical officers, who began their obligated service in 1946, will return to civil status by 30 June 1948. The computed strength of medical officers 1 January 1948 will be 2950 or over. In brief, the personnel picture is this:

We have definite need for 3000 officers so the loss of the V-12s later in the year will be felt keenly.

The Medical Services Corps is firming up, but serious vacancies will exist during the year.

The Nurse Corps situation is approximately one third below authorized strength.

The outlook of the hospital corpsmen situation is beclouded by low percentages of reenlistments. It is hoped that efforts toward stepping up recruitment will meet the minimum demands by next spring.

2. The high standard of professional management and care so long rendered our sick and wounded will be lowered unless commanding and senior medical officers take immediate steps to meet the situation. The Bureau is cognizant of and most sympathetic to the problems that will arise. The Bureau believes, however, that curtailment in unnecessary or perfunctory examinations, laboratory, x-ray, and interdepartmental consultations, may be a fertile field for the closest supervision. Junior medical officers, residents and interns, under proper supervision, will have to assume greater ward responsibilities. Navy

medical standards are well known and must not be lowered at the expense of the patient. The patient's immediate care and early recovery must continue to be our primary object.

3. Nurses will have to assume more individual bedside responsibilities. To this end it is directed that Chief Nurses review nurses' assignments to duty so that all junior nurses below the rank of Lieutenant Commander may perform less administrative work in favor of bedside duties.

4. Economy in the assignment of all medical personnel must be employed with firm austerity. Medical and surgical wards may have to be combined so that the seriously ill, the bed patient, medical or surgical, may be in closer proximity to medical and nursing facilities.

5. A recent survey conducted in a naval hospital reveals that there was an average of eighteen (18) laboratory tests performed on each patient.

6. While this Bureau is extremely reluctant to interpose an expression of opinion that might stifle initiative and be interpreted as voicing dissension against the very best and most modern medical practices, it is considered that many unnecessary laboratory procedures are performed. Many of these tests are not necessary; furthermore too frequently the reports receive little attention by the medical officer requesting them.

7. This Bureau is well aware of the acute shortage of technicians in naval hospitals and regrets that this condition is likely to exist for a considerable time, in fact, may actually get worse.

8. It is believed that a great deal may be accomplished to alleviate the workload upon the laboratories of the various hospitals if the bulk of laboratory work is reduced; and it is believed that this work may be drastically reduced without prejudice to the patient. It is suggested that interns and residents be required to turn to in the laboratories, this to enhance the doctor's knowledge and to engender a keener sense of sympathy for laboratory technicians and a pronounced diminution of the number of requests made upon the laboratories.

--BuMed C. A. Swanson

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